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MILITARY-POLITICAL ISSUES

FLT ADM S. GORSHKOV ON STUDY, USES OF OCEANS

Moscow MORSKOY SBORNIK in Russian No 12, Dec 82 (signed to press 14 Dec 82)
pp 16-26

[Article by CinC Navy Flt Adm SU S. Gorshkov: "Contemporary Problems of the Study and Development of the Ocean"; passages rendered in all capital letters printed in boldface in source]

[Text] The study and development of the ocean under present-day conditions is gaining special importance in connection with the people's ever-increasing dependence on its resources. Significantly increased technical capabilities in recent years allowed a sharp increase in the intensity of research. These were the circumstances which led to the UN General Assembly declaring the period from 1971 through 1980 an oceanologic decade.

Two directions can be discerned in the approach to problems of the ocean's study and development. The first direction, involving an expansion in opportunities for the joint use of its resources for increasing mankind's welfare, was advanced by the Soviet Union, countries of the socialist community and many developing states. The second direction is typical of the leading capitalist countries headed by the United States. It has the purpose of using the ocean for militaristic interests as a sphere of economic expansion and for establishment of their domination here, and to open up as it were a new era of colonial conquests, this time not on land, but in the ocean depths.

The world community cannot reconcile itself with such aspirations of the imperialist powers.

For a long while the overwhelming majority of world states¹ have been connected with opportunities for use of ocean resources and profitable shipping lanes crossing it. That is how the first aspect of the problem, which can be termed the "man-ocean" problem, originated and has been developing continuously: the ECONOMIC aspect.

At the same time people were using the oceans and seas as springboards for conducting military actions. These capabilities rose as productive forces developed. The present-day operational-strategic features of ocean-going nuclear missile fleets have reached a pinnacle at the present time. That is how the

second aspect of the very same problem--the MILITARY aspect--arose and has been developing continuously. Both these aspects exist objectively in close unity, and their importance is growing continuously.

The ocean occupies more than 70 percent of the surface of the globe. With a colossal volume of water exceeding 1.3 billion cubic kilometers, i.e., 97.3 percent of all our planet's water reserves, it exerts an enormous effect on the physical condition of continents and the earth's atmosphere. The great spatial and temporal changeability of basic physical and chemical characteristics of ocean waters affects the processes of vital activities of living organisms which take place in it.

The ocean waters are in constant movement. Their movements, which form a general system of currents, serve as the basis for uniformity of the ocean's nature. Subtropical circulations, which include for example such powerful currents as the Gulf Stream and Kuroshio, represent some of the chief elements of this system.

Diverse physical processes occur in ocean waters. A global transformation of metabolic energy occurs here as a result of the uneven heating of waters and the atmosphere. The ocean absorbs three-fourths of solar radiation which the earth receives, thus maintaining the temperature conditions of water masses and the air masses above them, and it regulates the entire cycle of planetary atmospheric and oceanic circulation. It has an effect on formation of the climate of all regions of our planet. Any sector of land, even one farthest from the sea, inevitably experiences its influence. All this still is far from understood and is the subject of careful study by researchers and scientists, seafarers and oceanographers.

The ocean's fauna and flora are unusually varied, numbering more than 160,000 species of fauna and some 10,000 species of flora. The life of some 250-260 species of birds is linked with the ocean. The ocean represents the lungs of the globe. Around half of the oxygen entering the atmosphere is produced in the process of photosynthesis by phytoplankton in the ocean.

We still have a very poor knowledge of the ocean world although as far back as deep antiquity (4,000-5,000 years ago) man learned to use the sea lanes for communication with island areas and even made ocean voyages on primitive (in modern terms) cane and board raft vessels. The well-known Norwegian scientist-oceanologist and sea traveler Thor Heyerdahl tells about this very persuasively in his book entitled "Early Man and the Ocean," published in the Soviet Union in 1982.

But the study of the ocean as an object of scientific understanding of the planet began considerably later, some 250 years ago, and its systematic study has been conducted for a little over 100 years. Nevertheless even today we know very little about the ocean world and about all the processes occurring in its depths.

Thanks to scientific-technical progress, attention to the ocean was reinforced following World War II. Marine science studies began to be organized on broad scales both by individual countries and within the framework of coordinated

international programs. The scope of the work of basic research of the ocean, as well as for interests of the armed forces, increases each year. For example, in 1966, in elaborating a 5-10 year program for study of the ocean, the Department of Oceanography of the U.S. Presidential Scientific Consultative Committee defined its primary direction as support of national defense. In fact when we turn to data on U.S. federal appropriations allocated for the study and development of the ocean, such as in 1975, it can be noted that some third of the entire amount (\$244 million) of \$782.5 million went to the Defense Department. Various federal departments, universities and science centers are widely enlisted to perform this work. At the same time the federal budget does not take account of U.S. Navy expenditures for oceanographic research to support the activities of submarines and ASW forces and means. According to some American sources,² in that same year of 1975 this comprised a rather impressive amount--at least \$550 million. Oceanographic research directed at a study of features of sound propagation under the water in various parts of the ocean, acoustic characteristics of water masses and soils, as well as work of hydrographic and geodetic survey and on ocean biology represent special interest to the Pentagon. To this end floating and underwater facilities which can affect the freedom of navigation and scientific research are being set up for this purpose in vast expanses of the ocean. This predetermines the appearance of one other aspect of the "man-ocean" problem--POLITICAL-LEGAL.

In recent decades there has been a reinforced trend toward a more ordered legal regulation of all kinds of ocean uses. The 3d UN Law of the Sea Conference lasted some 10 years. Here the delegations from practically all countries in the world worked out an international legal document defining the all-encompassing legal regime of marine expanses. In all phases of the Conference the USSR delegation consistently advocated a most rapid development of a new Law of the Sea Convention on a compromise basis which would be a significant contribution toward strengthening international security and would help prevent conflicts among states on the seas. To facilitate progress in the Conference's work and considering the interests of developing countries, the Soviet Union accepted a number of concessions (recognition of the concept of a 200-nautical mile economic zone, the permissive procedure of scientific research in the economic zone and on the continental shelf, and so on).

The leading capitalist states, and the United States above all, took a different approach to resolving the global problem facing the Conference. Their desire for undivided rule on the ocean expanses was manifested most vividly in the adoption, at U.S. initiative, of national laws on development of deep-water seabed resources. Using this legislation and the related threat of substituting a system of "minitreaties" for the Convention as a blackmail tool, the American administration placed the Conference on the verge of disruption and delayed adoption of a new Convention for a year. But the demands of the United States and its other NATO allies to recarve provisions of this document concerning exploration and development of seabed resources beyond shelf limits in their favor--demands which were utterly unsubstantiated--ended in total failure. At the 11th Session of the Conference held on 30 April 1982 a Law of the Sea Convention was adopted and the process of signing it began in December 1982.

Questions of an intensification of scientific studies of the ocean are more acute in this connection. Back in the middle of this century a need arose, under the influence of objective needs of oceanographic science, for creating a certain cooperation of states to conduct synchronous studies over considerable areas of the ocean. Several major international programs were developed for studying the tropical Atlantic (1962-1964), the Kuroshio current (1965-1971), the Caribbean Sea (1967), the Northeast and Northwest Atlantic (1973, 1976, 1977), and so on. The Soviet Union is taking an active part in fulfilling the majority of them. An exchange of international information is of great importance for ocean study. Over 70 countries--members of the UNESCO Intergovernmental Oceanographic Commission (MOK)--participate in it. The information exchanged is carried out through world oceanographic data centers located in the USSR and United States. Each year the results of observations from several hundred expeditions carried out in various parts of the ocean arrive in the USSR. The Soviet Union passes on materials of 40-45 voyages of its science research vessels for use by members of the UNESCO MOK.

Soviet scientists are making a substantial contribution to the total sum of knowledge about the ocean. They have to their credit the measurement of the deepest depressions of the Pacific Ocean, and the discovery and study of an underwater sound channel, submarine ridges in the Atlantic and Arctic oceans, the fine structure of hydrophysical fields, synoptic vortices, the dynamics of water masses in the deepest parts of the ocean, life at extreme depths and so on.

The purpose of oceanographic research at the present stage is to develop and improve prognostic models reflecting conditions of the ocean medium and to perform comprehensive programs for the study of ocean and atmospheric processes and their connection with mesoprocesses and microprocesses which determine the status of weather on all continents. Oceanographic studies are multifaceted (according to the subject criterion of ocean study they can be divided arbitrarily into hydrophysical, hydrochemical, geophysical and biological), but all of them are associated by the overall theme of understanding the ocean. This is determined by the close interrelationship of various kinds of studies. For example, biological studies require a simultaneous study of the physical state of water masses and chemical processes in those areas in which living organisms are being studied, and a knowledge of chemical processes is necessary for constructing a hydrodynamic model of the ocean.

Primary efforts in the area of hydrophysical studies are directed at creating and improving a thermodynamic model of the ocean and developing a unified model of circulation of the ocean's water masses and the atmosphere above it. This will permit describing dynamic processes in the ocean from the microscale processes to planetary processes with consideration of their mutual influence. The study of microprocesses is being given much attention of late, since without a knowledge of their mechanisms it is impossible to obtain a valid picture of planetary-level fields and create prognostic models.

Studies of ocean acoustics play no small part. This is determined on the one hand by the importance of a practical use of sound waves for detecting objects under the water, and on the other hand by rapid receipt of information about the status of bottom relief.

An important place in hydrophysical research is held by the study of ocean optics--optical fields, conditions of their formation and interrelationship with other fields--and a determination of primary and secondary hydro-optic characteristics, principles of light propagation in an aqueous medium, and optical properties and conditions of the ocean surface.

Hydrochemical research is a rapidly developing direction in ocean study. Of particular interest here are phenomena occurring at the interfaces of water masses with the atmosphere, the bottom and the coastline and which are called upon to play an important part in the development of prognostic models thanks to establishment of the nature of chemical processes.

Geophysical research encompasses the study of spatial-temporal characteristics of the magnetic and gravitational fields in the ocean, properties of the ocean bed and thickness of the crust beneath it.

The basic task of biological research is a study of the vital activities of varied species of marine animals, plants and entire ecological systems. Scientists are attempting to obtain an answer to the question of how a change in climate affects ecosystems and understand the mechanisms regulating their structure and interaction.

Oceanographic research vessels (OIS) of the Ministry of Defense Main Directorate of Navigation and Oceanography (GUNiO MO) make a great contribution toward accomplishing ocean study tasks in the interests of the national economy and marine sciences, along with the scientific research vessels of the USSR Academy of Sciences and vessels of the USSR State Committee for Hydrometeorology and Environmental Control. They take part in the fulfillment of many international and practically all national programs for ocean study.

Vessels of the Navy's Hydrographic Service "Admiral Vladimirskiy" and "Faddey Bellingsgauzen" left Sevastopol' on 2 December 1982 on an around-the-world Antarctic expedition following the route of the great Russian seafarers F. Bellingsgauzen and M. Lazarev, and they will perform extensive scientific studies.

The studies being performed have not only an applied character, but a basic scientific character as well. The use of modern equipment for ocean study including electronic computers with an automatic oceanographic data collection and processing system and sounding bottles allows the Navy's OIS to measure a considerable number of parameters of oceanographic fields simultaneously in various scales of their manifestation.

Study results will augment the Soviet national store of materials of hydro-meteorological, hydrographic, geophysical and hydrobiological observations in the ocean. They are the basis for compilation of various aids, sailing directions, sailing manuals and atlases needed for naval ships, general navigation and for science of the ocean in general.

Soviet marine charts supporting navigation in practically all parts of the world have been published based on materials of Soviet hydrographic studies in the oceans and seas and with the use of foreign cartographic sources. The

Soviet "World Ocean" chart published by GUNIO MO in 1979 contains the latest seabed relief data and is one of the best in the world.

There was a significant expansion in the products list of equipment for performing studies as the extent of knowledge about the ocean grew and as demands for its study increased. Numerous scientific establishments, firms and concerns in many countries are working on its development.

Automated systems are being installed aboard oceanographic scientific research vessels which have been made on the basis of EVM [electronic computers] and which provide for the collection, analysis and processing of oceanographic data, the monitoring of measurement errors, their tie-in with navigational measurements, recording on a machine-readable medium and reproduction in a graphic form. A set of equipment including precision and quick-response meters for all physical characteristics of the ocean medium and various fields of the planet is being used to determine oceanographic parameters. Further development of oceanographic systems apparently will follow the line of supporting full automation of the research process.

The use of submersible vehicles for various purposes is something new in the study of oceans and seas. Scientists' efforts are aimed at increasing their submersion depths, creating conditions for conducting scientific studies and increasing the safety of aquanauts.

Automatic anchored and drifting research buoys and self-contained hydrometeorological stations have become widespread of late. They can be used to measure several dozen hydrometeorological parameters and transmit them to shore centers over a radio channel or via artificial earth satellites. The use of automatic buoys permits setting up systems for rapid coverage of the hydrometeorological situation over vast ocean areas.

Great prospects for oceanographic studies opened up with the beginning of the use of specialized earth satellites. Outfitted with television, infrared and radiometric gear, they send information to earth about cloud cover above the ocean, the ice cover, temperature of the surface layer of water, wind at the water's surface, and sea states. Flying around the globe in a time enormously less than the natural changeability of the marine and air medium, such satellites are capable of providing a global picture of the distribution of many important oceanographic parameters.

A number of the most important scientific-technical problems connected with study of the biological structure of the ocean medium and the upper mantle of the earth's crust, with the performance of hydrologic and hydrographic studies, and with the performance of rescue operations, salvage operations and other underwater engineering work cannot be resolved without man's active penetration into the ocean depths. This gave birth to a new direction in the theory and practice of human medicine and physiology, which studies conditions of the body's behavior under the extreme conditions of the hydrosphere. People have penetrated to a depth of 200-300 m relying on the latest scientific achievements. In the future this may be taken to 500 m or more. This requires the creation of more sophisticated special gear supporting human life and activity in the underwater medium.

Thus the problem of human vital activities at great depths is a new independent area of medical and physiological research, the success of which will determine accomplishment of tasks of developing the ocean.

As was noted earlier, there are enormous raw material, biological and energy resources in the planet's hydrosphere. People will turn their gaze more and more toward the ocean as opportunities for producing everything necessary for their existence from the interior and surface of the land are exhausted. "In the near future," affirms well-known Soviet scientist S. Mikhaylov, "the land will not be in a condition to satisfy mankind's growing needs for metals, minerals, petroleum and coal as well as for chemical raw materials and proteins of animal origin. The ocean is the first extracontinental source for satisfying people's needs for food, chemicals, fuel-energy and mineral-raw material resources . . . and hence it is natural that there is a present interest in this matter."³

Mankind is striving for more complete use of ocean resources, as manifested not only in an intensification of scientific research, but also in a growth of appropriations for its economic development. Over the last 20 years, for example, world capital investments in basic sectors of the marine economy have increased almost tenfold and in 1975 reached the vast sum of \$120 billion including \$60-70 billion for the sea mining industry, \$10 billion for the fishing industry and \$40 billion for shipping.⁴

Economic development of the ocean began with the use of its biological resources, which play an increasingly noticeable role in the food balance of our planet's population. Scientists believe that the ocean's potential biological reserves exceed those on land by many times over. Even today it "supplies" us with up to 15 percent of proteins and 5 percent of fats of animal origin in worldwide consumption.⁵ The world catch of fish and other sea products comprises some 70 million tons annually,⁶ and this index may be increased in the near future.

The competitive struggle which unfolded in fishing and other fisheries (which is so typical of the capitalist system of economic operation) often assumes interstate scales and at times complicates relations even among allies in one and the same blocs. Suffice it to recall in this regard the recent so-called "wars": the "cod" war between Iceland and Great Britain, the "lobster war" between France and Brazil and the "tuna war" between the United States and Mexico. Acting on the one hand were countries with insufficient economic and military might and, on the other hand, great sea powers which often used combatants of their navies as a "convincing" argument for resolving the dispute.

According to scientists' prognoses, there are more mineral and chemical resources in the ocean than on land. Sea water itself is a valuable "poly-mineral liquid ore" which contains more than 70 elements of the Mendeleev Table. The total reserves of some of them reach astronomic proportions. There are billions of tons of manganese, iodine, bromine, vanadium, magnesium, potassium and calcium, and millions of tons of gold, silver, thorium and other rare elements. Reserves of uranium (4-5 billion tons) and heavy water (over 270 trillion tons) can have very great importance for technical progress in the future.⁷

Very rich deposits of iron and manganese (polymetallic) nodules⁸ containing manganese (25 percent), iron (14 percent) as well as cobalt, nickel, copper, titanium and vanadium have been discovered over vast areas of the Atlantic, Indian and Pacific ocean seabed. The depths of the seabed contain enormous stores of petroleum and natural gas, especially in continental shelf areas.⁹

In 1975, for example, the reserves of marine petroleum comprised 21 billion tons and those of natural gas, 14 trillion cubic meters.¹⁰

In addition to petroleum and natural gas, the shelf contains deposits of coal and ores. Huge deposits of coal have been surveyed near the shores of Great Britain, Japan, Spitsbergen, Chile, Australia, Turkey, China and the United States. There were 57 underwater coal mines in operation in the world as early as the beginning of the 1970's. Japan obtains 30 percent of all coal from the depths of the seabed, and Great Britain gets 10 percent of its coal from there.¹¹

Today the industrially developed countries are conducting intensive scientific research and development work to create special equipment for the production of minerals in deep-sea areas.

The heightened interest of capitalist countries in the ocean is caused by the fact that some 70 percent of minerals on land are under the control of socialist and developing countries. The economy of the United States and its chief partners--Great Britain, Japan, the FRG, France and others--depends to an enormous extent on the import of a number of the most important kinds of raw materials. Satisfaction of their constantly growing needs for energy and for mineral and food raw materials depends more and more on the possibilities of developing the ocean's economic resources. For the time being, however, this problem is being solved primarily by importing raw materials obtained on land.

Petroleum and natural gas are of particular importance out of all the kinds of strategic raw materials found in the depths of the sea and ocean bottom. By the mid-1970's the shelf accounted for 20 percent of the total production of petroleum and over 10 percent of natural gas and, according to specialists' forecasts, by 1985 the proportion of petroleum will comprise some half of world production. At the present time more than 20 countries are producing petroleum and natural gas from the seabed, and some 100 countries are conducting exploratory drilling and geological exploration work. There are major petroleum and natural gas deposits in the North Sea, Gulf of Mexico, Persian Gulf and other areas.

In the next few years the exploration and development of seabed mineral resources beyond the continental shelf will gain an exceptional role. It has been established that there are gigantic deposits of metals in nodules and in certain other formations such as sulfides on and under the seabed. According to scientists' estimates the oceans' reserves of raw minerals from which manganese, cobalt, copper, nickel and other metals can be obtained surpass all such resources explored on land by tens and even hundreds of times. While some 20 countries will be able to derive perceptible profits from activity on the continental shelf beyond the 200-nautical mile economic zone, practically

all world countries including inland countries will be able to do so with appropriate organization of work on the seabed beyond the shelf.

Beginning in 1967 the United Nations has been making attempts to draw up an appropriate seabed regime beyond the continental shelf. Initially the UN Seabed Committee worked on this, and then the 3d UN Law of the Sea Conference did so beginning in 1973. The new Law of the Sea Convention contains principles regulating the exploration and development of seabed resources beyond the continental shelf. In particular, this area with its resources is declared mankind's general legacy. It is open for use by all states exclusively for peaceful purposes. Work in the area will be carried out by a specially formed international Agency (through its Enterprise) and by countries participating in the Convention and their representatives. This will ensure a just and rational use of seabed resources with consideration of the needs of developing states. Such prospects, however, clearly were not to the taste of the United States and its partners. Despite the fact that their attempts to introduce changes to this part of the Convention which would have secured for them unilateral advantages and preferences suffered failure, they have not rejected their intention to set themselves up in the most promising and rich seabed areas according to the principle of "first come, first served," contrary to the interests of all other countries.

U.S. ambitions have gone so far that President Reagan officially announced refusal to sign the new Law of the Sea Convention adopted in April of this year. His statement that Convention provisions concerning development of seabed resources allegedly "do not correspond to U.S. goals" is absolutely unfounded. The fact is that this is that part of the Convention to which the American delegation, which represented the three previous U.S. administrations, gave greatest attention in its development.

The present administration apparently cannot reconcile itself with the fact that under the Convention ocean resources can be used in the interests of all countries, and developing countries above all. The government of monopolies does not like the fact that the Convention contains rather effective anti-monopoly provisions (albeit not rigid ones) in the section devoted to seabed resources and that it does not allow uncontrolled access of private companies to the production of these resources. Moreover, the imperialist monopolies cannot reconcile themselves with the fact that the decisionmaking procedure in the Council of the future International Seabed Agency does not allow the United States to play the very same dominating role in it as in international financial organizations. It should be noted that not one of the states participating in the Law of the Sea Convention ever have been in such isolation as the United States, no matter what proposals it advanced during the work. Not counting Israel, even the closest of its NATO allies did not deem it possible to vote against the Convention. The Canadian government sent Washington a note of protest in connection with the new administration's unilateral rejection of previously reached agreements.

It is quite obvious that the U.S. delay of talks on problems of the ocean and nonrecognition of many provisions regulating the international legal aspects of the "man-ocean" problem previously worked out with its very participation is the result of a policy directed at obtaining additional opportunities

guaranteeing the conduct of those activities which are connected with a resolution of the problem of dominance in the ocean.

By its obstructionist policy with regard to the Law of the Sea Conference, the United States sets itself in opposition to the interests of the world community. This is absolutely unacceptable. The "threat" of the present U.S. administration not to sign the Convention must not stop other countries. Adoption of a mandatory international law will permit regulation of relationships of all countries in the development and use of the ocean and regulation of rules for navigation and use of sea expanses.

The seas and oceans already are beginning to be used for the accommodation of various kinds of enterprises in connection with the rapid inclusion of seabed mineral resources in the sphere of economic activity of developed capitalist countries. Some parts of the ocean even now are gaining strategic importance having been turned into areas of heavy industry developed and concentrated in small water areas with enterprises for the mining, storage and processing of raw materials. For example, Great Britain, Norway, the FRG and other countries erected numerous facilities in the North Sea for the production and transportation of petroleum and natural gas. Possibilities are being studied abroad for using manmade islands for construction of industrial enterprises. For example, it was reported in the press that the Japanese are developing a project for creating a manmade island with the construction on it of a metallurgical plant, aluminum plant, oil refinery and petrochemical plant, as well as a large-capacity distilling plant. There will be 20,000-25,000 persons servicing the island. Despite the seeming fantastic nature of such projects, they may become reality in the near future.

Great horizons open up for mankind in connection with the possibility of developing inexhaustible ocean reserves of mechanical, thermal and chemical energy. There is colossal energy potential contained in ocean waves, currents and tides. The use of the oceans' hydrothermal energy, i.e., the energy obtained from the temperature difference at the sea's surface in warm areas (25-30°C) and in the depths (around 5°C), can provide much for mankind.

Other projects for using the energy of oceans are known. The United States, for example, is examining the question of using the heat and flow of the Florida part of the Gulf Stream, which in the American specialists' estimate basically can satisfy the country's energy needs. It is true that for now only scientific explorations of technical solutions are being conducted in these areas. At the present time only the first experimental tidal electric power plants have been created, but significant prospects already are looming for practical development of the ocean's energy potential for mankind's needs.

There are truly inexhaustible capacities contained in the energy found, for example, in ocean reserves of heavy water. It is generally known that one kilogram of heavy water would be able to compensate in energy released for the combustion of 400 tons of coal. When we consider that the ocean has hundreds of trillions of tons of heavy water, it is quite obvious that the discovery of inexpensive methods of recovering such energy from the ocean can lay a path toward solving the energy problem of modern times, which is greatly disturbing mankind and which has drawn the careful attention of the 26th CPSU Congress.¹²

In appraising the acute need for a further build-up of the country's available power, USSR Academy of Sciences President Academician A. Aleksandrov stated: "The traditional methods, i.e., by increasing the production of energy carriers (petroleum, natural gas and coal), will cease to satisfy us in the foreseeable future. There must be a substantial change in the structure of their consumption and wide use of nontraditional energy resources."¹³ I would like to add to this that the ocean also can become one of the primary sources of energy used by mankind in the future.

The role of oceans and seas is exceptionally important in supporting transportation ties among continents and countries. The uninterrupted functioning of sea lines of communication is a matter of life and death for a number of industrially developed coastal and especially island states such as Great Britain and Japan. It is not by chance that marine transportation plays a leading role among all kinds of transportation. It accounts for over three-fourths of world freight exchange. This is above all because the production costs of sea shipments is 40-45 percent lower than rail and 20 times less than motor vehicle shipments. The total volume of world ocean and sea shipping is growing continuously. In just the last 20 years it increased more than four-fold, comprising some 3.5 billion tons a year in the mid-1970's.

The Atlantic Ocean holds first place in shipping, accounting for over two-thirds of the world freight turnover. Its basin contains 8 socialist, 23 developed capitalist and 53 developing countries, with all of them accounting for 80 percent of the world industrial production.¹⁴

More than 20 percent of world freight is shipped over sea lanes of the Pacific and up to 10 percent over those of the Indian Ocean.

Ocean and sea lines of communication are of great economic importance for the Soviet Union. For this reason the Communist Party and Soviet government give constant attention to the development and improvement of our country's sea transportation ties with other states, which requires the performance of major, goal-oriented scientific research involving the creation of charts, sailing directions and aids to navigation, organization of a weather forecasting service, and other measures assuring the most economically profitable organization and management of shipping.

In pointing out the ever growing importance to many countries of marine production of food, raw material and energy resources and the expansion in maritime shipping, the foreign press notes on the one hand their growing economic dependence on the extent of ocean development and on the other hand the appearance of new serious sources of international conflicts. "In the year 2001 we could easily develop mines and agriculture on the seabed and use transportation and military facilities. As soon as we begin to use these new bases of economy, a new arena of conflicts automatically will appear."¹⁵

Suppositions are even expressed that as manned seabed stations and industrial facilities are created the developed capitalist countries will attempt to establish "underwater spheres of influence."

The waters and bed of the ocean are being turned into an object of struggle and expansion through the efforts of a number of capitalist countries. Evidence of this is the keen struggle of NATO allies--Greece and Turkey--for sources of petroleum discovered under the Aegean Sea. Such situations, and there are many in the modern world, can lead to military conflicts.

The irrepressible thirst of capitalist states to seize more and more areas of the ocean also is manifested in their attempt to invest even small islets lost in the ocean, such as the British rock of Rockall located more than 200 nm from the British Isles, with rights not only to territorial waters, but even a continental shelf and also a 200-nautical mile economic zone. To this same end areas of underwater volcanic activity in the Pacific are under constant U.S. and Japanese observation. The islands appearing here serve as an object of immediate seizure.

And so the rivalry to acquire riches of the hydrosphere and to extend states' influence to vast ocean zones led to a sharp intensification of the struggle among imperialist countries. Man's contemporary level of understanding of the ocean affected the change in methods and forms of armed warfare, and the strategic and operational employment of fleets above all. Through efforts of the imperialist powers the ocean has been transformed into an enormous springboard for conducting combat actions and naval operations by all-arms fleets--submarines, surface combatants and naval aviation. The role of the marine medium has risen unusually in the modern era of acute struggle between two opposite social systems, where imperialism headed by the United States is conducting feverish preparations for a new world war, having placed the most important scientific-technical achievements at the service of this task. The ocean also has become an arena for employment of other branches of the armed forces.

Development of the ocean opens up opportunities for a further spread of military actions from the ocean surface into its depths. Suffice it to note that following World War I submarines increased submerged depth by almost tenfold. Mine ordnance previously employed only in coastal and shallow-water areas now can be used at depths of several thousand meters, according to the western press. American sonar submarine detection systems are located at great depths of the ocean floor.

In viewing the ocean as a springboard for conducting armed warfare and for deploying strategic nuclear-missile groupings of armed forces for these purposes, the United States is carrying out major, costly projects across a broad front to fit it out and prepare it as a theater of military operations.

In summing up what has been said, we will note that the ocean is becoming a more and more important economic factor in the life of many countries and the object of intensifying competition and acute political and potentially armed struggle among them. It is a worldwide storehouse of enormous riches and a source of energy resources, the door to which is still open to all for now, but the imperialist states are trying more and more persistently to gather all ocean resources into their hands. For this reason an understanding of the essence of the problems of its economic development has not only a national economic importance, but a defense importance as well.

The problem of ocean development is inseparable from preservation of peace on the planet. Comrade L. I. Brezhnev emphasized: "Peace is not just a question of security. It is also the most important precondition for resolving the most important problems of modern civilization . . . which even today are beginning to concern many people: resolution of the problem of energy resources, environmental protection, elimination of such phenomena as mass hunger and dangerous diseases, and development of ocean resources."¹⁶

The new international legal regime of the ocean, the primary provisions of which were secured in the Law of the Sea Convention, is called upon to play a very important role in world use of maritime expanses. The preamble to this document recognizes its great contribution toward establishing a legal regime for seas and oceans which would facilitate international communications, the just and effective use of their resources, and the study, protection and preservation of the marine medium as well as its living resources. The preamble expresses confidence that development of maritime law reached in this Convention will contribute to a strengthening of peace and security of nations and aid their economic and social progress.

The Convention precisely defines the limits and regime of sea expanses (territorial waters, economic zones, continental shelf and so on) and the regime of international straits, archipelago states, the open sea, inland and partially enclosed seas, the seabed beyond the continental shelf and so on. There is a regulation of such very important kinds of human activity in the ocean as shipping, fishing, the development of marine minerals, construction of manmade islands and facilities, and prevention of pollution of the marine medium. A procedure is established for delimiting sea expanses between adjacent states. A system of measures is envisaged for the peaceful settlement of disputes involving this activity and for creating appropriate international judicial and arbitration entities.

For the first time this document will secure standards of conducting scientific marine studies for all states and competent international organizations.

But we cannot fail to consider that our position in matters of ocean development, shared by the overwhelming majority of progressive, developed and developing states of the world, differs from the position of the United States and large imperialist powers following it which are attempting to use the ocean expanses above all as a springboard for the struggle for world domination as well as for expansion and coercion. This is clearly reflected in their military doctrines, which are actually oriented on the so-called "ocean strategy," reflecting not only military, but also fundamental economic and political interests of western countries in the ocean, and those of the United States above all. In conformity with the course of their postwar policy, they are continuing to seek new supplementary opportunities for resolving one of the most important problems of their policy--establishment of domination in the ocean, which is a part of the concept of winning world supremacy which they declared long ago.

An important role is set aside for study of the ocean and expansion of the development of its biological, raw material and other resources in accomplishing the tasks set by the 26th CPSU Congress for the USSR's further economic

and social development. This requires enormous efforts not only of groups of scientists, but also of a large number of practical businessmen. A rational system of economic management in the hydrosphere has to be created and affairs conducted so that its reserves are not exhausted, with thought given not only to today, but also tomorrow. The question of preserving and reproducing ocean resources has to be resolved just as keenly and comprehensively as is their very use.

In discussing the military aspect of the "man-ocean" problem we must proceed from the persistent striving for peace by our party and state. It is important to turn the ocean into a zone of peaceful and mutually advantageous cooperation of all countries, setting a detente policy in opposition to a policy of aggravating international tension and preparing for a new world war being conducted by the present U.S. administration and countries of the aggressive NATO bloc following it. An important place in these preparations is being given to naval warfare, which forces us, in resolving the overall problem of national defense, to take steps to eliminate the growing threat from ocean axes. Creation and development of the Soviet oceangoing fleet--a reliable guarantee of the Soviet Union's security against attack from the sea--is connected with this.

Soviet navymen live with the same interests and thoughts as their people. They stand reliably on guard over the peaceful labor of the builders of communism and socialism's achievements. All naval personnel are responding to resolutions of the November 1982 CPSU CC Plenum and to the statements and conclusions of CPSU CC General Secretary Yu. V. Andropov which he expressed in the speech at the Plenum with a total straining of efforts in the struggle to achieve higher goals in combat readiness, service and training, and with new patriotic initiatives in socialist competition, and thus they are making a growing contribution toward a further reinforcement of national defenses.

FOOTNOTES

1. Of the more than 168 states existing in the world, only some 30 do not have their own sea coast.
2. SEA TECHNOLOGY, March, 1974.
3. S. V. Mikhaylov, "Mirovoy okean i chelovechestvo" [The World Ocean and Mankind], Moscow, Ekonomika, 1969, p 3.
4. MIROVAYA EKONOMIKA I MEZHDUNARODNYYE OTNOSHENIYA, No 9, 1976, p 26.
5. "Bol'shaya Sovetskaya Entsiklopediya" [Great Soviet Encyclopedia], Vol 18, 1974, p 988.
6. PRAVDA, 24 March 1978.
7. Osokin, S. D., "Mirovoy okean" [The World Ocean], Moscow, Prosveshcheniye, pp 96, 98.

8. A product of complex physical and chemical processes of precipitation of metals and other elements from the sea water and depositing around a neutral nucleus.
9. The shallow part of the seabed to depths of 200-500 m which rings the land comprises some 8 percent of the total seabed area.
10. MIROVAYA EKONOMIKA I MEZHDUNARODNYYE OTNOSHENIYA, No 10, 1977, p 76.
11. "Problema issledovaniya i osvoyeniya Mirovogo okeana" [The Problem of Exploring and Developing the Ocean], edited by A. I. Voznesenskiy, 1979, Leningrad, Sudostroyeniye, p 237.
12. See "Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress], Moscow, Politizdat, 1981, p 145.
13. KOMMUNIST, No 4, 1981, pp 84-90.
14. MORSKOY SBORNIK, No 3, 1981, p 75.
15. JOURNAL OF THE ROYAL UNITED SERVICES INSTITUTE FOR DEFENCE STUDIES, No 4, 1972, p 15.
16. L. I. Brezhnev, "Za spravedlivyy, demokraticheskiy mir. Za bezopasnost' narodov i mezhdunarodnoye sotrudnichestvo" [For a Just, Democratic Peace: For the Security of Nations and International Cooperation], Moscow, Politizdat, 1973, pp 42-43.

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NAVAL FORCES

SWEDISH PRESS REPORTS ON SUDDEN LARGE-SCALE BALTIC BUILDUP

Expansion of Liepaja Port, Base

Stockholm SVENSKA DAGBLADET in Swedish 15 Dec 82 p 4

[Article by Tom Hansson]

[Text] "The Soviet Union is expanding Liepaja Harbor in Latvia into one of its largest naval bases. The base is designed for nuclear submarines and attack vessels and will be the largest in the Baltic."

This was reported by Julijs Kadelis, head of the Latvian World Federation's information office in West Germany. Kadelsi presently is in Sweden.

According to Julijs Kadelis, the harbor in Liepaja is of great importance to the Soviet Union. This is especially true because it is ice-free the entire year. The profitable Druzhba (Friendship) Fishing Kolkhoz was forced to move and the area was declared a military zone. Large quantities of advanced electronic equipment have been shipped to the area for installation in the underground bunkers that will accommodate the large nuclear submarines.

"About 20,000 Russians presently are occupied with construction work at Liepaja Harbor. It is reported that there will be 40 to 50 military units there once the base is complete," Julijs Kadelis said.

Originally, the fishing kolkhoz was to be moved to the port in Ventspils. There is a shipping port there, however, from which chemical products and oil are sent to the United States by way of Occidental Oil. For this reason, the fishing kolkhoz now will be relocated south of Ventspils.

After completion, Liepaja will join Paldiski, Klaipeda, Kalingrad, and Riga as the largest Soviet naval bases in the Baltic. According to Western sources, the base in Liepaja is intended to be used for operations against Scandinavia.

At present, the Red Banner Baltic Fleet has 358 ships, including 42 large nuclear-powered warships and 28 nuclear-powered submarines, all of which have nuclear weapons on board. According to Western sources, there are 140 missiles with nuclear warheads in the Baltic, primarily SS-4 and SS-5 missiles, but also some modern SS-20's.

According to Julijs Kadelis, Russian influence in Latvia has increased in recent years. The Latvian population comprises 53.7 percent of Latvia's 2 million inhabitants. The corresponding figure for the capital city Riga is 30 percent.

"There are protests against the spread of Russification," Julijs Kadelis said. "This is true primarily among young people. On 18 November--the day commemorating free Latvia--the Latvian flag was raised above a hospital in Riga."

"And on 24 November the fruit and vegetable market at Central Square in Riga was burned down to protest high prices. One kilogram of meat costs 20 rubles at the market, although an ordinary teacher earns only 200 rubles per month. Bread prices, on the other hand, are low and bread is readily available."

Security police appear on the scene soon after any attempted protest begins. Several people were arrested and taken away in connection with the events of 18 November this year. Eight young people remain in jail or in psychiatric hospitals after they attempted to raise the Latvian flag at the freedom monument in Riga on 18 November.

Almost one fourth of the Latvian population in Latvia is Catholic and the Catholic Church plays an important role among the people, according to Julijs Kadelis.

"Protest movements are forbidden, however, and organizations such as Latvian Neatkarības Kustība (Movement for an Independent Latvia) are forced to work illegally in small groups of 15 to 20 people. They hand out leaflets, arrange concerts, and form cultural study groups."

According to Julijs Kadelis, the Russian influence will increase in the coming years. Among other things, Soviet convicts are sent to work, especially in the chemical industry in Latvia.

"Ten thousand prisoners have been placed in Krustpils, an area with a normal population of 14,000 people. Plans are to relocate 30,000 in Tukum near Riga," Julijs Kadelis said.

Swedes See Increased Threat

Stockholm SVENSKA DAGBLADET in Swedish 20 Dec 82 p 8

[Article by Erik Liden]

[Text] Extensive expansion of Soviet Baltic Sea ports and orders for new ships are increasing the military threat to Sweden. There is general agreement over this among the various military intelligence services.

This past year, Swedish Viggen planes patrolling the Baltic Sea have used reconnaissance cameras to verify that major construction work is underway in Liepaja and other Latvian ports. A large pier is being built straight out into the Baltic Sea and, if expansion continues, Liepaja could become the largest

port in the entire Baltic Sea. Other Baltic ports also are being expanded and improved. Blasting and dredging are underway to make them deeper.

Navy Expanded

Intelligence sources with which SVENSKA DAGBLADET spoke advanced several theories to explain the Soviet buildup. First of all, the effort to build larger naval ports may be motivated by increased foreign civilian traffic at other ports. Secondly, the naval buildup is reflected in the purchase of new vessels.

As recently as several months ago, the Soviet Union ordered 14 icebreaking commercial vessels from Wartsila Shipyard in Helsinki.

These reinforced vessels could be used by Soviet amphibious troops, which hold exercises in the Baltic Sea each month. The ships also may be intended for the base in Murmansk and the surrounding area where ice is a problem during the winter.

At the same time, major expansion is planned for the port in Tallinn, Estonia, at a cost of 3 billion Swedish kronor.

The Johnson Concern expects to bid on the project, which will begin in 1983 or 1984.

Increased Threat

In answer to a direct question, the Swedish Naval Staff indicated that the threat to Sweden continued to grow. The possibility of rapidly and secretly loading large numbers of amphibious troops on special ships and providing safe passage for commercial ships has increased noticeable in recent years.

This, along with increased Soviet airborne troops in the Baltic Sea region, has led to increased Swedish reconnaissance operations in the Baltic Sea. Within a few days, seven or eight airborne divisions with heavy equipment can be ready for operations around the Baltic Sea.

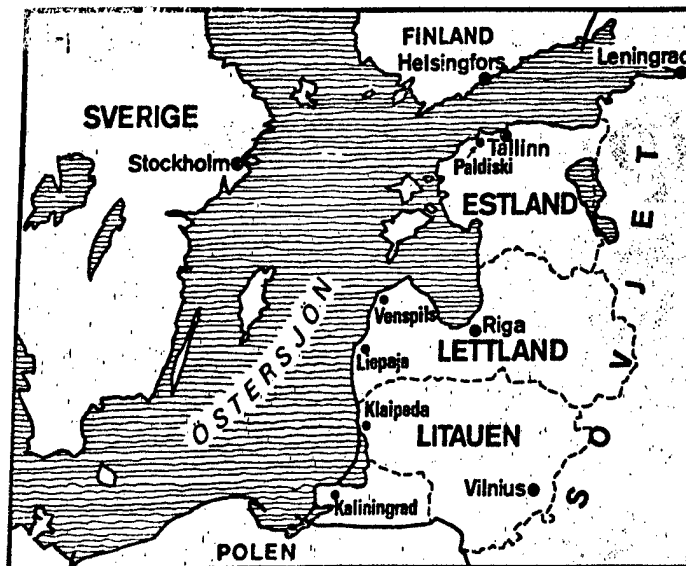
Reconnaissance Cameras

With the Viggen's modern reconnaissance cameras, details of ports around the Baltic Sea can be photographed from high altitudes and the pictures can be analyzed and processed at special intelligence laboratories in Sweden.

In this way, during clear weather, developments in Poland since 13 December last year have been followed hundreds of kilometers into northern Poland.

In a similar manner, Swedish high-altitude radar stations can track airplanes far into the Soviet Union.

The radar stations also can track extremely fast American intelligence aircraft that patrol the Baltic Sea at velocities well in excess of the speed of sound and at extremely high altitudes--often over 25 km.



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CIVIL DEFENSE

NECESSITY OF PSYCHOLOGICAL TRAINING STRESSED

Moscow VOYENNNYYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) p 17

[Article by I. Galuzinskiy, inspector, civil defense headquarters, Sevastopol': "The Components of Steadfastness"]

[Text] In the Leninskiy rayon of Sevastopol', on one of the command post exercises the chief of the trade and catering service, V. Krasnoshtan, was given a question: are there psychological losses among his subordinates? The answer followed--no. But how can this be? For the employment of weapons of mass destruction in case the imperialists unleash a new world war will exert a considerably greater psychological influence on people than was the case in past wars. Even in the course of World War II more than 1,000,000 cases of the hospitalization of soldiers due to psychological disorders were recorded in the armies of the imperialist states, and of them 500,000 were discharged from the army in the course of the war due to unsuitability for the performance of service.

This circumstance already convinces us of the necessity to intensify attention to moral-political and psychological training and to instilling in people steadfastness and a readiness to accomplish their duties under the most difficult conditions. For the solution of this problem, it seems to us, it is necessary first of all to create a good moral-psychological climate in the collective. Each of us knows how distressing it is to work without a spiritual uplift. And, evidently, the implementation of any measure should begin with the psychological training of people.

For these purposes, attention should be turned toward the instruction of commanders of non-militarized formations in questions of moral-political and psychological training and their ability to create a good psychological climate in the collective. It is necessary that they know their men, their special features, and their attitude, which of them has not quite enough will and who, let us say, cannot hold out for long in a difficult situation.

Again, A. S. Makarenko called on the teachers "to create a chain of exercises, a chain of difficulties, which have to be overcome and thanks to which a good person emerges." In Sevastopol', we have conducted important work on the creation of psychological zones and stricken areas which require of the men of the formations the overcoming of certain difficulties and stimulate them to endure them and thereby to strengthen their will. In the training grounds of Leninskiy rayon, for example, the fire-fighting service of the city (service chief A. Skorobogatyy)

created a psychological zone which includes: a small bridge over an open container with a burning fluid; a metal platform of a scaffold with damaged technological equipment; a heat and smoke chamber and labyrinth; a small one-and-a-half-story house with a stricken area; and a sector of radioactive and chemical contamination.

Now, in conducting lessons in this zone the men of the non-militarized formations work out training tasks with the complete straining of strength and overcome difficulties steadfastly and courageously, developing moral-psychological qualities within themselves. Of course, they are not born on order. M. I. Kalinin said: "It would be naive to think that steadfastness can be born by words however correct and good they may be; steadfastness is generated first of all by battle and by combat actions."

Large and many-sided possibilities for the moral-political and psychological training of civil defense personnel were created at a recently conducted demonstration combined installation exercise where people unexpectedly found themselves in the difficult situation of a fire hot spot, zone of smoke screens, in a destroyed building, and in a burning mockup of a motor vehicle. Various emergency situations and malfunctions of individual protective equipment were created. All this furthered the psychological tempering of the men in the non-militarized formations. In which regard, the difficulties were continuously made more complex, which trained them to control themselves and to control their behavior in accordance with the combat situation which had developed. And this is very important. Where, if not on an exercise and lesson, is it best to place a person under conditions which require the demonstration of will, mutual assistance, and selflessness so as to generate psychological steadfastness in him.

The work experience of the MPVO [local air defense] formations in the Great Patriotic War in the period of Sevastopol's defense suggested to us the necessity to work out the cooperation of various services in stricken areas. Thus, the cooperation of medical-sanitation formations and emergency repair teams was organized. The men of the emergency repair teams helped the communications personnel in excavating damaged cables, and the communications personnel, in turn, helped the emergency repair team to pick its way to the basement where people were located, and so forth. All thus furthered not only their practical training, but also the working out of cooperation, mutual assistance, and moral-psychological tempering.

The example of actions in besieged Sevastopol' by the emergency repair formations of the "Vodokanal" [water and sewage] MPVO headed by N. Semenyushkin became a good school for the emergency repair work of the production administration for the water and sewage facilities of the city. And when damage occurred on the line of a large-diameter water conduit which ensures the water supply for several microrayons of the city due to an hydraulic shock, the installation civil defense chief, A. Katushev, raised an emergency technical group of pumping stations reinforced with engineering-construction equipment to eliminate the damage.

Altogether 26 men and 10 units of equipment participated in eliminating the damage. The work was directed by the commander of the emergency-technical group, communist V. Pushkov, who has been working at this enterprise for 22 years. Many difficulties arose in its elimination due to the large amount of water which emerged in the area of the break, soft ground, and the formation of an area of quicksand. High professional training, psychological steadfastness, and good knowledge of the water supply

system permitted them to keep their heads and to eliminate the major damage in short times. The civil defense personnel, participating in the elimination of this damage, displayed steadfastness and skill and thereby showed their readiness for possible military tests.

We make active use of the city newspaper SLAVA SEVASTOPOLYA and city radio and motion picture films in the psychological training of the non-militarized formations and the entire city population. In which regard, we consider the approach to the psychological training of the population itself as a political and moral category which is necessary for the builder and defender of socialism.

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CIVIL DEFENSE

RADIO LECTURES ON CIVIL DEFENSE AT KIEV MEDICAL INSTITUTE

Moscow VOYENNNYYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) p 17

[Article by D. Volokhov, civil defense chief of staff of the institute: "Radio Talks in the Dormitories"]

[Text] For several years radio talks on civil defense [CD] have been conducted in the student dormitories of the Kiev Medical Institute imeni Academician A. A. Bogomolets. The subject matter is selected by the institute's CD staff, it is coordinated with the party and Komsomol committees, and then the talks are organized jointly with the student councils which are created in the dormitories. Active participation in the preparation of the talks is had by a student of the medical department and member of the student council, V. Kononenko, as well as by dormitory superintendants A. Shishkevich and V. Polozun.

As a rule, the talks are conducted in the evening when the majority of the students are in the dormitories. Some subjects have been recorded on recorder tapes and are repeated periodically. The following talks have already been heard: "A Matter for Everyone," "Civil Defense Warning Signals and Actions on Them," "What Should Be Done with the Threat of Enemy Attack," "Rules of Behavior in Protective Structures," and a number of others.

This work is being made more active in the period of preparation for exercises, competitions, and other civil defense measures. The cycle devoted to the 50th anniversary of USSR Civil Defense was especially interesting.

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CIVIL DEFENSE

TRAINING AT A WATER TREATMENT PLANT

Moscow VOYENNNYYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) pp 20-21

[Article by A. Sviridov, civil defense chief of staff of an installation, Leningrad: "...And the Hands Do"]

[Text] Our installation, which combines dozens of stations, is part of the "Vodokanal" [water and sewage] administration and is engaged in the removal and purification of runoff water. The working conditions of its personnel (danger of sickness from gas, injury from liquid chlorine, and so forth) introduce some specific features in the civil defense [CD] training of our personnel, too. For many must constantly have equipment for protection of the respiratory organs and skin near at hand and often must participate in eliminating the aftereffects of flooding.

All this, and the course for raising the role of practical lessons which is being persistently conducted in civil defense, forced us to think seriously about the corresponding training-material base. To be honest, the seemingly excessive difficulty of the forthcoming matter held us back from the accomplishment of this intention for a long time. But now, when the first results are available, it can be said with confidence that the fears were in vain and the difficulties were obviously exaggerated.

Where did we start? I will tell about this in greater detail and perhaps our experience will be useful for someone.

First of all, considering the missions of the installation's civil defense, the special features of its production activity, and the working conditions of its non-militarized formations, we determined the number and specific features of the necessary training sites. We planned how to arrange them on the allotted sector so as not to hinder the movement of transportation and people and not do destroy the outer appearance of the surrounding territory. We calculated the requirement for materials and labor and financial expenditures.

In studying all these questions, and then in the course of construction, we were given effective assistance by the CD staff of the rayon headed by Lieutenant Colonel A. Mamychev and its courses (chief O. Kopytko). In which regard earlier, back in the planning stage, it was decided also to use the training sites later for the practical training of the students in these courses.

The installation CD chief, M. Voronov, issued an order which determined the volume of work, times, and responsible executors. He assumed the checking of its accomplishment.

A small digression: prior to this, measures on improving the training base were envisioned in our annual training plans. But they remained useful wishes until they were confirmed by organizational work.

From the very beginning, despite its modest scales the construction acquired a patriotic ring, recalling that civil defense is a national matter. On the eve of its glorious 50th anniversary each one considered it his duty to make his own feasible contribution.

The work assigned to the mechanical repair shop (chief V. Malinkevich) and the subunits headed by senior engineers A. Lutsenko and I. Bondar' was accomplished clearly. A war veteran, brigade leader F. Il'in, a fitter who completed his active duty in the tank troops, A. Khar'kov, brigade leader A. Stankevich, painters M. Gitlits and A. Popova, and foreman A. Radkevich worked well. Thanks to common efforts, the installation received thoroughly equipped elements for the training grounds.

Although outwardly the training sites do not appear to be gaudy, they permit the practical working out of many procedures envisaged by the civil defense training program. Thus, using a tower, we drill in the accomplishment of procedures in rescuing victims from the upper stories of buildings. It is made of sheet steel welded to a frame of angle metal and it rests on a concrete slab. The flat roof with a small slope for the runoff of water has a guardrail with two gates and it serves as a work platform for the rescuers. The climb to the platform is along an attached ladder with handrails. The dimensions of the tower frame are 2 x 2 x 3.15 meters and the height with the guardrail is 4.15 meters.

The interior premises which are closed by a metal door are also used. Five-tiered shelves with a total area of 12 square meters are set up there and the spaces under them and, partially, the corridor serve for the storage of training equipment. Such a decision proved to be very fortunate. It freed us from trouble when delivering equipment to the lesson sites.

The tower is the center of the training sector. The emergency manhole for the protective structure is adjacent to it (this was considered during planning). Drills in rescuing people from destroyed and buried shelters take place here.

A special simulator is envisaged for developing the ability to localize several types of damage on pipelines (water-, gas-, and heat supply). It is constructed rather simply. Three 3-meter pipes with a diameter of 100 millimeters are laid on a frame of angle steel with a height of 120 centimeters. "Damage" in the form of cracks of various configuration are applied on each tube, which consists of two halves with flanged connections, in the longitudinal and transverse directions. The pipes are hermetically welded on one side. Removable wooden cone-shaped plugs are inserted in their open ends. The pipes are connected with each other by adapters.

Water goes to the simulator through a hose from the water supply system. At this moment streams spurt from "damaged" points. Using intermediate valves, the arrival of the water can be regulated and it can be directed to selected sectors.

A set of tools, bands, and sheet rubber have been made for the simulator. Several trainees can accomplish the procedures of sealing the cracks and other simple operations simultaneously. When necessary, this training site can be equipped additionally, envisioning the working out of more difficult procedures for the localization and elimination of damage on the pipelines.

Practical work on extinguishing and localizing fires is conducted at another training site. There we find a standard fire shield, iron trays to simulate a hot spot, containers with sand and water, and a fire escape. Equipment for the fire-fighting crew is stored in the interior premises of the tower.

A special place is allotted for practical work in partial medical processing and decontamination. Here, a rope is stretched between two portable poles for hanging out clothing. Also envisaged are a set of brushes, brooms, and wiping materials, flasks with decontaminants, and containers for impregnating regular clothing to give it protective properties. An arrow indicates wind direction.

Special training sites have been set up for practical lessons with the personnel of reconnaissance formations and observation posts. In addition, reconnaissance transfers its actions to the entire territory of the installation.

Each training site has a panel with graphic aids and brief explanations of the procedure for the accomplishment of practical work. Information on the course of a lesson or exercise and on people who have most distinguished themselves operationally is reflected on special "screens."

The training sites which have been equipped at our installation have already undergone repeated "road testing." They were shown in action to participants of assemblies of the CD activists of the rayon and the "Vodokanal" administration. Practical lessons are often conducted here with students of rayon courses.

We borrowed a procedure for the conduct of practical lessons which seemed instructive to us from the masters of production instruction of the courses. Usually, a master divided a training group into small subgroups (of five or six people) headed by the best trained students. First, he himself demonstrated how to perform one or another procedure, and then he had each trainee repeat it. The students who were distributed in subgroups passed through all training sites sequentially and the lessons acquired a more active character.

It was also noted that the attitude toward civil defense at the installation changed with the appearance of well equipped training sites. Formerly, for example, when working out procedures for rescuing victims from the upper stories no one thought of the best way to tie those being rescued with a rope. They acted according to the principle--do it the best you can, expending excess time. By now, it has become clear to many that the correct skill and ability proven by experience are necessary even in what at first glance is a very simple matter. Thanks to drills on the tower which has already been mentioned, the tying operation has begun to be accomplished correctly and literally in minutes. Specialists from the fire-fighting service, Major A. Yakovlev and Captain S. Ivanov, have become experienced tutors in this matter and not only in this one.

We are far from the thought of presenting our training base as some model. On the contrary, we believe that it requires further improvement and development. We, as they say, "honked our own horn," that is, we proceeded from our own capabilities. A comparatively small (40 x 9 meters) platform permits us to work out basic practical procedures. The equipment did not require special material, labor, and financial expenditures and was made in short times. Thus, the basic structure--the tower--was made in 10 man-days and the simulator--in 3.

Also of no little importance is the fact that with the equipping of all training sites the possibility for their further improvement was envisaged. For example, we now consider it expedient additionally to make schematic diagrams of the energy supply of the installation and a residential building. Since the work of rescuers in a buried emergency manhole is not examined, we intend to make one more mockup and to reproduce part of a manhole on it. We will cover the frame of the mockup with a net or transparent film so that the leader of the lesson and the trainees can observe the actions of the rescuers.

It should be noted that our sector of practical work can easily be combined with some sports structures intended, in particular, for the training of pre-draftees. This also creates certain advantages, since it permits relying on the assistance of the trade-union and DOSAAF organizations.

There is a saying: "Frighten the eyes and hands will work." And that is how we doubted and expressed fears, and how we began seriously and the matter proved to be within our power.

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CIVIL DEFENSE

TRAINING PROGRAM IN LENINGRAD'S LENINSKIY RAYON

Moscow VOYENNIYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) p 21

[Article by A. Podoprelov, chief of civil defense courses, Leninskiy rayon:
"Are We Mistaken?"

[Text] Demonstration exercises are conducted annually in various regions of the country in accordance with approximately the same scheme: assembly of supervisory and command-management personnel, assignment of missions, accomplishment of measures in the period of threat of enemy attack, dispersal and evacuation, elimination of the aftereffects of the enemy's employment of weapons of mass destruction, and so forth. They will also be conducted in the future. However, because of this accustomed scheme interest in them has been blunted somewhat. For it is no secret that on many demonstration exercises the situation changes insignificantly and the special situations migrate from one plan to another.

Of course, five or six years ago supervisory and command-management personnel displayed great interest toward demonstration exercises since everything was new for them. Now it is another matter. During this time, the majority of the comrades have undergone training at civil defense [CD] courses, repeatedly attended exercises and led them themselves, and the general level of civil defense knowledge has risen. Now it is much more difficult than formerly to prepare and conduct an interesting and genuinely useful demonstration exercise.

Therefore, new possibilities must also be sought, seeing that the idea of teaching supervisory and command-management personnel to adopt competent decisions in any most difficult and rapidly changing situation remains the leading idea as formerly.

Being guided by these considerations, in the Leninskiy rayon we tried to get away from the accustomed scheme and to conduct a demonstration exercise at several installations at once. In so doing, we did not pose the goal of showing in detail how to work out all problems from the start of the exercise to its critique. As it seems to us, there is no need for this now since the sequence of working out the problems is well known to the majority of the supervisory personnel. We decided to concentrate attention on individual elements, but to demonstrate them in detail, completely and, as they say, in the best form.

At one installation, those who were present saw measures to increase stability while at another a prefabricated evacuation post was deployed and the organization and

conduct of evacuation measures were shown. A medical first aid detachment was deployed in the suburban zone on the base of hospital No. 2; practical aid was rendered to "victims" who arrived from a stricken area.

The work of the post for issuing individual protective equipment was instructive. Here it was possible to see how the chief of the post and all sections work: unloading, issuing, preparing individual protective equipment for use, and technical inspection.

We selected a plant for ferroconcrete articles to demonstrate this post. And namely why it? A training grounds has been set up at this plant where, in addition to other elements, there is a chamber for the technical checking of gas masks. And located alongside is a building which has been adapted as a warehouse for the storage of individual protective equipment, in which regard without any special material expenditures. In short, there is something to demonstrate.

One can ask: why did we involve several installations on the exercise? The fact is that the exemplary working out of all problems at one enterprise is difficult to show, and sometimes is simply impossible. But taken together, they provide a complete notion of how the basic civil defense problems should and can be solved with consideration, naturally, of the specific features of the installations.

Observing the reaction of the supervisory personnel in the course of the demonstration, we were convinced that it has become completely different and considerably more interesting. This means that the search was not in vain. And what do the journal's readers think about this?

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CIVIL DEFENSE

FIFTIETH ANNIVERSARY OF USSR CIVIL DEFENSE

Moscow VOYENNNYYE ZNANIYA in Russian No 10, Oct 82 (signed to press 13 Sep 82)
pp 2-3

[Article by Col Gen V. Dement'yev, deputy chief of USSR Civil Defense for political affairs: "Civil Defense is Half a Century Old"]

[Text] The significant date - the 60th anniversary of the formation of the USSR - is being met by our people with new victories in all areas of economic and cultural development, and with strong convictions that their peaceful constructive efforts are guaranteed by the high defense capability of the socialist state.

The party has been consistently directed by the Leninist principle of combining peace-loving foreign policy with a guarantee of constant readiness to repel any aggressor. The correctness of this approach has been confirmed by the entire history of the Soviet state. This proven course has been legislatively incorporated into the USSR Constitution.

The strengthening of our Motherland's defense capability at this time is unthinkable without preparing well in advance the defense of the rear areas, and first and foremost, the defense of the Soviet people.

As far back as 1918, when a mortal threat hung over the young republic of the Soviets, V.I. Lenin, with his characteristic insight, stated that "the primary productive force of all mankind is the worker and laborer. If he survives, we will save and restore everything. But we shall perish if we cannot save him."

True to the legacies of the great leader and to its own slogan of "All in the name of man, all for the good of man," the Communist Party developed and improved the system of defense measures for protecting the population and the national economy from the blows of the aggressor. On October 4, 1932, the USSR Council of People's Commissars approved the "Statute on Air Defense of the Union of Soviet Socialist Republics," establishing the missions of local air defense (MPVO), the predecessor of the USSR Council of Civil Defense, which has been in existence for half a century.

This decision of the party and government was taken in a period when aviation in the armies of capitalist countries was undergoing rapid development, and together with this grew their capability to conduct air strikes against targets in our rear areas.

In Germany, the fascists who took power openly proclaimed that their main goal was to destroy the USSR. The party and government, strengthening the country's defense, developed the MPVO and improved the military preparedness of the population. The goal of these measures was to defend the victories of the Great October and to protect the Soviet people from imperialist aggression. The titanic labor of the people under the direction of the Communist Party in the prewar years was the basis for our victory in the Great Fatherland War.

In the very first day of the war, enemy aviation subjected Kiev, Sevastopol, Odessa, Vilnius, and other cities of our country to bombardment. The fascists counted on creating chaos in our rear areas through massive air strikes. But the enemys plans fell through.

Among the urgent defense tasks, an important one was for measures to protect people and targets in the rear from air attack. On July 2, 1941, the USSR Council of People's Commissars approved the decree "On the General Mandatory Training of the Population for Air Defense."

Party organs intensified their influence over the activities of the MPVO and took under their permanent control the construction of shelters and the training of unit personnel, formations and the population. Great importance was attached to propaganda on ways and means of defense. Commanders and political workers of the MPVO staffs, workers of the Society for Assistance to the Defense Aviation and Chemical Industry [Osoaviakhim], and the Red Cross were all enrolled in this propaganda work. A great deal of attention was devoted to explaining appropriate laws regarding the responsibilities of citizens for fulfilling their obligations in local air defense.

The significance that the party attached to the organization of reliable local air defense was written up in articles published during those years in the journals of the All-Union Communist Party (Bolsheviks) [VKP(b)] Central Committee: BOLSHEVIK, PARTIYNOYE STROITEL'STVO and PROPAGANDIST. "The experience of the war has shown," it was noted, for example, in the article entitled "Local Air Defense - The Most Important Task of Party Organizations," that "the MPVO is strong only where its heart and soul are made up of party organizations and all activists ... The most important task of party organs is to bring the MPVO up to combat readiness."

During the years of the Great Fatherland War, the local air defense fulfilled its duty with honor and contributed significantly to the all-people's struggle against the German fascist invaders.

A high degree of participation, combat spirit and patriotic enthusiasm were all characteristic of the behavior of the Soviet people in those horrible years. Courageously, not fearing self-sacrifice, the fighters of the MPVO carried on. At the basis of their exploits lay the understanding of the greatness of the cause for which they were fighting. They went to their deaths in order to give life and happiness to people on earth.

The Motherland paid high tribute to the services of the MPVO during the war.

Two thousand of its fighters were awarded combat orders and medals of the Soviet Union, and over 300,000 persons from units and formations of the MPVO received medals for the defense of Moscow, Leningrad, Odessa, Stalingrad, Sevastopol, Kiev, the Caucasus and the Soviet polar regions.

The emergence of qualitatively new military weapons dictated the necessity of transforming the MPVO into national Civil Defense in 1961. This step strengthened even more the humane and popular character of a system designed to protect the population and the national economy from weapons of mass destruction.

The aggressive nature of imperialism, about which V.I. Lenin wrote, has not changed. At the festivities in Tashkent, and trade union and Komsomol congresses, the General Secretary of the CPSU Central Committee, comrade L.I. Brezhnev, in elaborating on our Program of Peace for the 1980's, made proposals, important in principle, directed at preserving peace on earth. From the main rostrum during the second special session of the UN General Assembly, it was solemnly announced that the Union of Soviet Socialist Republics takes upon itself the responsibility of no first use of nuclear weapons. However, our peaceloving position did not receive a positive response from the leaders of western states. The militaristic circles of the USA and other NATO countries are accelerating the arms race. Highly placed persons in the USA are openly discussing the possibility of "preemptive" nuclear strikes and "limited" nuclear war. From the White House one hears open calls to the forces of reaction for beginning a new crusade against countries of the socialist fraternity.

The actions of the imperialist aggressive forces compel the Soviet people to maintain great vigilance and to strengthen the defensive might of their state. In modern war, with the use of weapons of mass destruction, the role of civil defense in guaranteeing the viability of our state has grown immeasurably. The party looks at civil defense as a component of overall state defense measures taken in both times of peace and war for the protection of the population against weapons of mass destruction.

Western propaganda is consciously striving to distort the true goals and tasks of USSR Civil Defense, and to prove that it is allegedly threatening to destabilize the strategic balance of forces, and that it is one of the factors that constitutes the "Soviet military threat." Comrade L.I. Brezhnev, in his answers to questions from the West German weekly, VORWAERTS, provided noteworthy rebuttals to these fabrications: "It is incredible, but it is a fact: Even the measures directed at safeguarding the security of a peaceful population in case of war are contrived explanations by specialists on anti-Soviet slander as a sign of 'aggressiveness'; the USSR allegedly is preparing 'for a first strike, and is hoping to protect itself from retaliation in shelters. Now, one truly has to have a pathologically distorted imagination in order to turn everything upside down! Is it possible for normal people to really believe these fabrications?"

"We do not want war and we are not preparing a war. But the Soviet people, through their own bitter experience, know what huge sacrifices there may be throughout the population as a result of an aggressor's actions."

Based on the experience of the Great Fatherland War and on a comprehensive analysis of the current situation and the development of military weapons, the CPSU Central Committee and the Soviet Government are formulating clearcut views on improving civil defense. The USSR Ministry of Defense has the responsibility for the direct control of civil defense measures.

Local party organs are constantly involved in increasing the level of activity in political work with regard to resolving problems of civil defense. They assure the active participation of all state, cooperative and social organizations directed at fulfilling assigned duties in civil defense.

For example, the experience of the Tsesisskiy district committee of the party of the Latvian SSR deserves some attention. The district committee is persistently striving to obtain greater personal responsibility on the part of installation directors and secretaries of party organizations for fulfilling programs to train the population in methods of protection against modern weapons and for conducting timely and high quality preplanned measures. Communist party member reports on the status of civil defense are listened to carefully in the district. At the same time, it is important that questions of civil defense are examined here in an organic unity with all other problems being resolved by the district committee. The command directing staff learns about the practice of party political work at meetings, class and demonstration exercises, while secretaries of party organizations and formation deputy commanders for political affairs attend seminars and consultations in addition.

There is much that is instructive in civil defense work that has been accumulated in the Lenin district committee of the city of Saratov, the Kokhtla-Yarvesskiy district committee of the Estonian SSR and many other party organizations.

A far from complete list of work forms and methods through which party organs implement the direction of civil defense includes: Periodic testing of the status of civil defense and political work in fulfilling civil defense measures in cities and districts, branches and installations of the national economy, and enterprises and educational institutions; giving practical on-site help; discussing civil defense [CD] problems in party committees and meetings and at meetings of activists, as well as gatherings and seminars of party members; and listening to staff and class leaders of councils and economic organs.

The role of primary party organizations in resolving problems of civil defense is great. With regard to this, the experience of the party organization of the Moscow Automotive Plant imeni Leninskiy Komsomol in particular is illuminating. (The secretary of the party committee is V. Babakin.) Here, their basic efforts are concentrated on fulfilling plans for accumulating protective structures and implementing measures for increasing the work stability of the installation by conducting high quality, comprehensive studies, training of non-military formations of CD, and training workers and employees in methods of protection from modern weapons of destruction and ways of getting rid of the aftereffects of an attack.

Directed by the orders of the 26th Party Congress and by the decrees of the CPSU Central Committee on ideological questions, party organizations devote a great deal of attention to publicity on civil defense and to forming high moral-political and psychological qualities among members of collectives. Enrolled in this work are a broad segment of party activists, leaders of the economy, specialists in CD services and the mass media.

Life experience convinces one that the efficiency of civil defense propaganda is greater when it is conducted in close connection with concrete problems being resolved by collectives. The quality of propaganda for civil defense is enhanced and the moral-political and psychological hardening of the Soviet people is increased when the humane nature of the goals and problems of civil defense are explained lucidly and when its combat traditions are explained, and when one shows in classes the extensive and courageous actions of its personnel in eradicating the aftereffects of natural disasters.

During the summer and fall of 1981, the staffs, services and non-military formations were subjected to a sudden and important test in a number of places. Thus, an extraordinarily difficult situation came about in August in the southern and central part of Sakhalin Oblast in connection with a typhoon, and in the central regions of the RSFSR in connection with extinguishing forest and peat fires. People who participated in cleaning up the aftereffects of these natural disasters, successfully coped with these difficult tasks. And they were helped in this by their knowledge and practical expertise gained in studies and exercises in civil defense.

In talking about similar incidents, one has to show the enthusiasm of civil defense workers and speak in detail about the self-sacrificing deeds in saving people and property.

A special place in the activity of every party organization and all communists should be given to the fulfillment of tasks emanating from the decisions of the May Plenum of the CPSU Central Committee with regard to publicity and fulfillment of the Food Program that was adopted by the Plenum. Communists should set the tone in order to successfully achieve this program. A great deal of attention should be devoted to these problems in preparing and conducting training in rural areas and knowing how to combine civil defense measures with kolkhoz and sovkhos production tasks, as well as agro-industrial complex installations. More concrete storehouses must be built for different purposes, which in case of necessity could be used as anti-radiation shelters. It must be remembered that civil defense resolves such problems as the protection of food, water, animals and plants from radioactive, poisonous and bacterial substances. All this increases the general stability of agricultural installations, and at the same time will facilitate the fulfillment of the Food Program.

On the eve of the 1982 academic year, the fighting men of the military unit, where the commander is Lieutenant Colonel I. Shkrobot'ko and the chief of the political section is Lieutenant Colonel A. Milyukhin, came out as the initiators of socialist competition, calling on all servicemen, workers and employees of units and staffs of CD to mark the 60th anniversary of the

formation of the USSR with new successes in achieving set goals. This patriotic initiative turned into a mass movement of all personnel in civil defense. Inspired by the decisions of the May Plenum of the CPSU Central Committee, personnel are striving to attain timely and qualitatively high fulfillment of tasks that stand before them.

A creative approach in resolving CD problems was manifested, for example, by the collective of one of the enterprises (Director, V. Grebenshchikov, Secretary of the party committee A. Fetisov). Here the productive tasks and civil defense measures are implemented as in a single unit. The enterprise collective has been awarded a Challenge Red Banner of the oblast party committee and oblast executive committee for successfully accomplishing their socialist duties in civil defense.

Going forward to meet the 60th anniversary of the formation of the USSR and marking the 50th anniversary of Civil Defense, the personnel of staffs, units and directing organs of CD are justifying the high trust of the party with honor by giving of all their strength, knowledge and experience to the cause of further improving methods of protecting the population and of increasing the reliability and effectiveness of its measures.

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CIVIL DEFENSE

CIVIL DEFENSE TRAINING IN UZBEK SSR

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pp 14-15

[Article by Lieutenant General S. Akhundzhanov, chief of staff, deputy chief of civil defense of the Uzbek SSR: "With Fraternal Help "]

[Text] Uzbekistan today is a region of flowering cotton fields and the most modern industrial enterprises. It is an industrial republic with a highly developed agricultural economy. It is an example of the inexhaustible creative strength of people devoted to the cause of the Communist Party.

When, during the years of the civil war, the workers of Uzbekistan routed the white guards and the Basmachi with the aid of the Red Army, they constantly felt the dependable support of fraternal peoples, first and foremost the great Russian people. When new factories and plants were being established in the republic, and entire branches of the national economy about which one did not even dream here before, the support for this progressive work was provided by the selfless fraternal assistance of peoples populating our multinational Motherland.

True friendship does not fear the most difficult of tests. The Great Fatherland War decisively proved how strong and unbreakable are the ties among our peoples. From the very first days of the war, Uzbekistan sent to the front its very best sons, who bravely fought together with Russians, Ukrainians, Belorussians, and fighting men of other nationalities.

Simultaneously, the republic turned into one of the arsenals of the Red Army. As early as the first months, up to 100 enterprises which had been evacuated from the western districts of our country began production here. Altogether, during the war 280 enterprises were brought into operation in the republic. The front received over 1,000 aircraft, over 8,000 aviation engines, around 300 million shells, mines and other ammunition from Uzbekistan.

Our sunny region gave a home to thousands of Soviet citizens evacuated from the western districts of our country. Many Uzbek families became real homes for children orphaned by the war. A Tashkent blacksmith, Shakhmed Shamakhmudov and his wife Bakhri, adopted and raised 14 children of different nationalities. In honor of the Shamakhmudov's patriotic deed, a symbolic

monument was erected in Tashkent on Friendship of Peoples Square in May of 1982. In the hard war years, the workers of Uzbekistan, together with all the Soviet people, shared the most difficult trials that fell to their lot, and made their contribution to victory over a common foe. And some time later, the entire country already came to the aid of our republic.

On an early April morning in 1966, the people of Tashkent were awakened by a hard underground jolt and a powerful rumble. The center of the earthquake, with a force of nearly eight points, was directly under the center of the city at a depth of 8 kms. As a result, houses were destroyed, primarily adobe, as well as some hospitals, schools, enterprises, and government and public buildings. This natural disaster, coming down on the city, did not break the spirit of its inhabitants. They knew that the entire country would come to their aid.

Only a few hours after the first underground jolts, the General Secretary of the CPSU Central Committee L.I. Brezhnev and the Chairman of the USSR Council of Ministers A.N. Kosygin arrived in Tashkent. Dozens of construction trains and waves of people, construction materials and medicine were sent here from every corner of the land.

Thousands of families who had suffered losses were settled in tent cities and especially organized dormitories. Builders from Moscow, Leningrad, other cities of the Russian Federation, and representatives of all fraternal republics participated in the reconstruction of Tashkent. Many cities took on the responsibility of building new blocks and entire microdistricts.

Among those who immediately came to the aid of the people of Tashkent were military personnel. Risking their lives, they carried people out of damaged houses, organized around-the-clock patrols, efficiently established tent cities in squares that had been destroyed, and gave aid to children's institutions.

On April 28, 1966 there was a meeting in Tashkent of the activists of the republic party, in which L.I. Brezhnev and A.N. Kosygin participated. In his speech, Leonid Il'ich Brezhnev laid out a program for cleaning up in the aftermath of the earthquake and assigned tasks to party, council, public and construction organizations. The workers of Uzbekistan accepted with great satisfaction the decree of the CPSU Central Committee and the USSR Council of Ministers "On Giving Aid to Uzbek SSR in Eradicating the Aftereffects of the Earthquake in the City of Tashkent."

Republic, oblast, city and district extraordinary commissions were created to expedite the elimination of the aftereffects of this natural disaster and to efficiently resolve any problems that may arise. In accordance with their decisions, the completion of rescue and disaster reconstruction work was guaranteed, public order was maintained, and all necessary measures were taken.

In eradicating the aftereffects of the earthquake, a great contribution was made by non-military formations of civil defense. As early as the day fol-

Following the earthquake, disaster reconstruction crews reestablished the basic lines of communication. Detachments of first aid personnel, reinforced by medical teams, put up more than 3,000 hospital cots in buildings and tents newly set aside for this purpose. Mobile apothecaries were organized quickly. Students from advanced courses of the medical institute and medical school carried out around-the-clock watches at 29 medical stations established in the tent cities. They were helped by over 3,500 activists of the Red Crescent Society.

There was an especially clear manifestation of moral-political and psychological preparedness on the part of personnel of CD formations during the elimination of the aftereffects of the earthquake. All formations worked selflessly, demonstrated initiative, bravery, and a high degree of conscientiousness and discipline.

In the battle with the mighty forces of nature the people won, with their courage and steadfastness, their friendship and fraternal spirit. Thanks to the generous and selfless aid of all the Soviet people, Tashkent quickly healed its wounds and literally before ones very eyes became of the most beautiful cities of our country.

It is not the first time nature has tested our readiness to stand up to its terrible force. That happened in April-May 1967, when, as a result of heavy rains, village floods occurred in several oblasts of the republic. An especially difficult situation unfolded in Tashkent oblast. The population, government institutions, schools and hospitals were evacuated from the danger zones.

It also happened at the time when an earthquake came down upon the settlement of Gazli, where the gas pipelines "Bukhara-Ural" and "Central Asia-Center" begin. In the very first hour after the underground jolts, formations of civil defense, called in through an alert, arrived in the disaster area and energetically began to work. A first aid detachment, sent from Kagan, arrived in the settlement of Gazli. The personnel of the Bukhar Oblast security service for public order carried out patrol duties. Three rescue teams of the services and a composite team from the Romitanskiy district worked effectively. As early as the first day, over 1,000 persons, 35 units of different machines and 77 trucks were working in the center of the earthquake area. The number of machines increased with every day.

Thanks to the efforts of the CD formations, the tent settlement received water toward the end of the first day. The radio network was repaired and the situation was broadcast over the air; appeals to the population were also broadcast, and leaders of local party and council organs made their appearances. It should be stated that people correctly understood the situation. They saw how greatly concerned about them were the party and government, and how much fraternal assistance was being given them by the whole country. And this gave them new strength.

In eliminating the aftereffects of the earthquake and reconstructing the productive might of Gazli, it was not only the local CD formations which

participated actively, but also servicemen from the Red Banner Turkestan military district and gas workers of Bashkiriya, Baku, Groznyy and other districts of our country.

The friendship of the people of the Soviet Union, born of October, is strong and indestructible. It manifests itself brightly in all our deeds and accomplishments. The united national economic entity of our country is the reliable material basis for the fraternal spirit and friendship of peoples. Soviet republics are jointly resolving the key problem of future progress, the task of intensifying production.

The workers of Uzbekistan are approaching the important date, the 60th anniversary of the formation of the Union of Soviet Socialist Republics with new achievements in labor. They have also achieved a great deal in resolving problems of civil defense. An example can be given by the Tashkent Collective of the Aviation Production Society imeni Chkalov, which last year scored first in the city inspection competition. Studies and other measures of civil defense were conducted here efficiently and on a high level. Monthly and ten-day CD meetings and discussions, film showings on defense subjects have become a tradition in the society. Active propaganda is being carried out on civil defense in housing areas. The Palace of Culture has a "University of the Future Soldier" where there are often meetings with veterans of war and civil defense, and evenings of questions and answers. Every issue of the oral journal "Civil Defense" is accompanied by the showing of an educational film. The library organizes readers' conferences and gives methodological help in selecting literature on civil defense.

To persistently perfect the knowledge and expertise of the population on civil defense means to actively participate in the further strengthening of the defensive capabilities of the Motherland. In recent years, trade union organizations of the republic have noticeably become active in this respect. The Fergana Oblast serves as an example. In honor of the important date, the 50th anniversary of the USSR Civil Defense, the Presidium of the Fergana Oblast Council of Trade Unions accepted a resolution on conducting an inspection competition for the best organization of propaganda on CD.

The work of Komsomol organizations of the republic on resolving CD problems has become more lively. The Secretariat of the Uzbekistan Komsomol Central Committee has accepted the resolution "On the Participation of Komsomol Organizations in Civil Defense Activities." Komsomol organizations are participating in the selection, deployment and instruction of formation activists in conducting comprehensive training, as well as ten-day and monthly activities on civil defense. The Tashkent Oblast Committee and the Komsomol city committee have good experience in this regard.

In connection with the coming jubilee dates, propaganda on civil defense has been activated. The leadership of the republic "Znaniye" Society held a consultative seminar on this subject. Problems of improving work by sections of civil defense in oblast organizations of the society were discussed at a meeting of CD chiefs of staff of oblasts and at meetings of their deputies on propaganda.

The Uzbek television and radio news implemented interesting measures. It carried out a correspondence conference of radio listeners and television viewers through a questionnaire published in the program called "Tashkent Speaks and Shows." In accordance with the proposals of television viewers, the time of telecasts on civil defense was changed and now they are being given in both Uzbek and Russian languages. Radio broadcasts on civil defense are also being transmitted regularly.

Representatives of over 100 nationalities live in our republic in friendship and harmony, helping each other. The ideas of socialism have united them into a single family, and the Russian language has helped establish mutual understanding between all peoples, large and small. This is why the 60th anniversary of the formation of the USSR is a great holiday for all working people of Uzbekistan.

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CIVIL DEFENSE

CIVIL DEFENSE TRAINING AT 'KHROMATRON' PLANT

Moscow VOYENNNYYE ZNANIYA in Russian No 10, Oct 82 (signed to press 13 Sep 82)
pp 16-17

[Article by R. Skalkin, secretary of "Khromatron" plant party committee:
"Under Party Committee Control"]

[Text] Our plant is a model enterprise in Moscow. According to the results of socialist competition, the collective has already taken first place for several years, firmly holding on to the Challenge Red Banner of the Kuybyshev CPSU District Committee and the executive committee of the district council.

It has also achieved notable success in taking civil defense measures. For their active work, 15 persons have been awarded the decoration "Outstanding Performer in USSR Civil Defense." Communists of the plant consider it an integral part of communist upbringing to train CD personnel, as well as workers and employees who are not part of CD formations; to carry out protective measures; and to educate the entire collective to have high moral-political and psychological qualities necessary for resolving complex and responsible CD tasks. We often have representatives from Moscow and other city installations come to exchange views on experiences. They are convinced that civil defense has become a solid part of plant life and is an integral part of its multifaceted activities.

It stands to reason that we did not arrive at our top position immediately. At first we were criticized for shortcomings and lapses at district party activist meetings on economics. The party organization, in a business-like manner, reacting to the criticism, conducted a great deal of work to strengthen CD. The creative forces of the entire collective were mobilized, first the directing, administrative and command staffs, and then the plant community was drawn into the work.

We decided to conduct annual party activist meetings on economics about CD issues, meetings of the party committee, as well as party meetings and assemblies of formation deputy commanders for political affairs. The best trained communists were designated for duties as service chiefs, formation commanders and deputy commanders for political affairs.

We strengthened the installation staff in the proper way. Communist I. Ignatenko became its chief. He works closely with installation CD deputy chiefs, service directors, and chiefs of shops and departments. The staff supports having close ties with the party committee and public organizations, and with their help resolves problems placed before the collective.

The plant party committee took on the responsibility for coordinating propaganda, and training and educational work. At its meetings, the annual plan is ratified and problems on strengthening civil defense work is discussed as needed. Party-political CD measures have been planned with a consideration of real conditions and modern requirements. Actively participating in this work are the trade unions and Komsomol organizations, the DOSAAF committee, the plant library and the installation radio broadcasting unit. In short, we have achieved the main thing: Every member of the collective conscientiously fulfills his obligations in civil defense and considers it his vital duty. Everyone understands the seriousness and current importance of defense measures.

An example of the state's attitude toward civil defense is shown by the director of the plant, communist Yu. Mashin, who knowledgeably directs it and asks hard questions if problems are not resolved in time. As said before, there are annual party meetings of activists on economics, at which decisions are made on improving CD and marking out specific parameters.

An important problem has been resolved: All workers and employees have been provided with means of protection. There is a CD training area where personnel of formations, as well as those who are not in formations, expand their theoretical knowledge and improve their practical expertise. There they also have colorfully decorated stands with photographs and posters reflecting progress in various studies and training.

In developing these stands, we give primary attention to their goal and ideological direction, and the accessibility of the material being presented. They reflect measures taken at the installation to increase its work stability and bring up basic problems on protecting workers and employees. The use of the shelter as a training area does not at all impair its combat readiness. But trainees who study there thoroughly learn its floor plan and get used to rules applicable to staying in a shelter structure.

Most of the shops have CD corners that display basic issues on protecting workers and employees, relevant to conditions in the given industry. We create them with the goal of expanding the knowledge of workers and employees and disseminating CD propaganda. Training aids, brochures, and journal and newspaper articles can all be found in the training area. Films on CD are shown in the conference hall.

Having established the necessary training-material base, the communists of the CD staff and shop party organizations have concentrated their primary attention on training workers and employees in methods of protection against weapons of mass destruction. Each subdivision selected civil defense study leaders who had gone through CD training courses in the district and ministry. They are given direct study training by communists of the installation CD staff. The chief of staff himself, as a rule, during the course of a year, conducts two to three study sessions in every subdivision on the most important topics. Cited as good instructors have been communists V. Pronin (Shop 12), P. Zakharov (Shop 13), P. Chemodanov (Shop 2), L. Gorobtsova (Medical station), and others.

An important direction in the work of communists of the installation and of all public organizations has been given by civil defense propaganda. The party committee gave the responsibility for conducting propaganda to the plant deputy chief of staff for CD, the deputy secretary of the party committee on propaganda and agitation, G. Novikova. The party-political work plan provides for lecture topics, reports and discussions on civil defense, presentations by the administrative staff, commanders and political workers of formations on local radio broadcasting, and in a large issue newspaper and wall bulletin board. For conducting oral propaganda, the party committee recruits propagandists, political information speakers, and qualified lecturers from the "Znaniye" society.

With the goal of military-patriotic education of the collective, we regularly organize ceremonial meetings dedicated to the Day of the Soviet Army and Navy, Victory Day and other notable events. We invite as guests representatives of the Moscow military district, instructors of the Military-Political Academy imeni Lenin and of CD courses in Moscow and the district, and honored veterans of the Great Fatherland War. Actively participating in this work are war veterans who work at the plant: Communists I. Ignatenko, N. Lomovtsev, I. Ovsyanikov, V. Dubovitskiy and others.

Recently the role and responsibility of the Komsomol committee and the shop Komsomol organizations have grown in work on civil defense. The secretary of the Komsomol committee, communist S. Demidovich, has planned the functions of the Komsomol organization through active participation of Komsomol members and young people in civil defense. In this activity, special attention has been given to medical formations and to communications and reconnaissance groups, consisting mostly of young people. In May of this year, the medical team, headed by Commander R. Zubanova and political leader O. Podol'skaya took first place in district competitions.

The entire range of party-political work and the active participation of communists in civil defense affairs positively influence the successful accomplishment of CD measures. As an example, a visual study session on propaganda, was conducted last year at our plant for assistants to CD chiefs of staff of autonomous republics, regions and oblasts of the Russian Federation, with whom we shared our experiences on organizing party-political work at the installation. This received a high evaluation from the leadership of the RSFSR CD staff. And in the jubilee year, the command-staff training session, under the direction of the installation CD chief, was conducted on a high methodological level. A good knowledge of their functional duties was shown by communists, the CD chief of staff and chairman of the plant evacuation commission L. Merkulova, the chief of emergency-technical service A. Sergeyev, and the chief of the anti-radiation [PR] and chemical defense [PKhZ] service, V. Dem'yanenko.

Prior to conducting a party activist or party committee meeting, the party committee group familiarizes itself thoroughly with the situation in the services and subdivisions, pinpoints shortcomings, and only then opens up for discussion reports by deputy CD commanders, service chiefs, formation commanders and their deputies for political affairs, shop chiefs and secretaries

of shop party organizations. We consider this to be a good method for not only exchanging ideas on work experience, but also as a means of increasing personal responsibility of communist leaders for fully implementing the requirements of the CPSU Central Committee and the Soviet government on improving civil defense.

We also practice conducting open party meetings in shops and departments, at which we examine problems such as training workers and employees, and preparing formations, as well as military-patriotic education and CD propaganda.

A great help in the matter of improving the installation's civil defense system and training workers and employees is the competition for the title of the best shop or section in CD. Socialist duties are accepted on a scale from factory down to the shops and are reflected in collective agreements. The plant administration and the trade union committee have established monetary prizes for the winners. Rules for the competition have been developed. Competition results are totalled every quarter.

In evaluating what has been done, one wants to emphasize that not all possibilities have been exhausted by any means. We have not yet fully studied problems relating to increasing work stability at the plant. The material-technical provisions of CD measures have not yet been fully implemented. We have also not fully disposed of cases of individual workers and employees not having a serious attitude toward fulfilling their CD obligations. The party committee and the entire plant party organization are persistently working to eliminate these and other shortcomings.

We are firmly convinced that any civil defense task and any measure directed at strengthening it can be successfully accomplished only through harmonious work of the entire collective of the installation. Communists of the plant remember well the Leninist legacy to thoroughly learn military affairs, and they are striving to live up to that legacy with honor.

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DOSAAF AND MILITARY COMMISSARIATS

UNUTILIZED OPPORTUNITIES IN TRAINING NOTED

Moscow VOYENNNYYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) pp 24-25

[Article by G. Prikazchikova: "Ready for Labor and Defense: Unused Opportunities"]

[Text] In the mail which the civil defense department of the journal VOYENNNYYE ZNANIYA receives, letters on the taking of the civil defense [CD] standards of the GTO [Ready for Labor and Defense] complex are infrequently encountered. If some data arrive from educational institutions, information from enterprises, institutions, kolkhozes, and sovkhozes is virtually absent. Meanwhile, we are speaking of a serious matter, of the complex "Ready for Labor and Defense of the USSR," an important component part of which is the civil defense section. What is the reason?

Bearing in mind that the editors' mail is a sensitive barometer, the editors gave their correspondent the task to clarify this reason. With the assistance of the civil defense staff of the Moscow oblast, four installations of the national economy were selected for visiting--the All-Union Planning-Design and Technological Institute of Secondary Resources (VIVR), the "Proletarskaya pobeda" factory in Mytishchinskiy rayon, the Central Design Bureau for Petroleum Equipment, and the Podol'sk Machine-Building Plant imeni Ordzhonikidze.

Guidance on this trip was provided by the recommendations adopted in 1974 on the basis of the decree of the Committee on Physical Culture and Sport with the USSR Council of Ministers, "On Refining the Section on Civil Defense in the Content and under the Conditions of Accomplishing the Requirements and Standards of the GTO Complex."

I recall that in accordance with the recommendations each one taking the standards should, first, answer two or three questions on methods and equipment for protection against weapons of mass destruction, second, stay in a gas mask with a physical load depending on age for one hour or 30 minutes and, third, accomplish two standards according to the commission's selection.

Although the test requirements of the GTO complex were brought as close as possible to the 20-hour program in 1974, it was assumed that the accomplishment of the standards will be only a preparatory (I stress the last word) stage after which the passing of the standards for the GTO badge should follow. In which regard, they will be given by a specially created commission, where possible under competition conditions. In this connection, it was recommended to committees on physical culture

and sport, the DSO [voluntary sports society] councils, and the physical culture organizations of departments that they include in the program of their competitions those civil defense standards which bear a sports-competition nature. What has actually emerged?

How They Take the GTO Standards

We are first in Mytishchi, in the All-Union Planning-Design and Technological Institute of Secondary Resources. Here the taking of the GTO standards is timed with the taking of civil defense tests. By order of the director, a commission has been created and a program and times for examinations have been determined. Those taking the examinations are required to answer two or three questions on the equipment and methods for protection against weapons of mass destruction, stay a certain amount of time in the gas mask with a physical load, and accomplish two practical standards. It is not difficult to become convinced that the program is namely the one recommended in the GTO complex.

Together with an officer from the city CD staff, I visited the institute on the day when the taking of examinations took place in the group of heads of laboratories and department chiefs. They were given by the installation civil defense chief of staff, Yu. Pimenov, and two more commission members including the physical culture instructor, G. Sharapov.

First, each one taking the test must answer the questions on the card and then spend a certain time in a gas mask and accomplish two practical standards--putting on the gas mask (No 1) and applying a tourniquet (No 17). In which regard, all are to work out only those standards about which they were notified ahead of time.

"And how about the other standards? And why did you select applying a tourniquet as the second standard?" I asked the chief of the CD staff.

"We selected what is most suitable for such final work," he answered but, evidently, sensing the inadequacy of the argument, he added: "There will be different standards next year."

How They Interpret the Rules

Thus the first surprise. Until recently, I believed that the requirement "to accomplish two standards according to the committee's selection" which is contained in the recommendations means the following. A person comes to the examination (this is what we call the measure) prepared to take all practical standards without exception and not knowing specifically which assignment he will receive. The members of the commission announce to him the numbers of the standards which have befallen his lot only at the very last moment when taking the examination.

Is it possible that in the VIVR one of the requirements of the GTO complex was interpreted somewhat subjectively? What is thought in this regard by other CD chiefs of staff who are the main and, frequently, the only organizers of work on the section of the GTO civil defense complex?

My question did not nonplus the CD chief of staff of the "Proletarskaya pobeda" factory, A. Malakhtin.

"In order to pass the test in the GTO complex," he answered confidently, "it is necessary to pass two or three practical standards. I selected six standards which fit our factory and we are testing in them here. And in general, we do not make a difference between the standards of the 20-hour program and those of GTO."

As we see, the interpretation of the requirements is somewhat different at the factory. Of 20 standards, it is considered necessary and possible to pass only six here within the framework of GTO while the remainder are included among the "passive."

Nor did the visit to two installations of the national economy in Podol'sk introduce any clarity in this question--the Central Design Office for Petroleum Equipment and the machine-building plant imeni Ordzhonikidze. At each of them they had their own approach to passing the GTO standards and their own evaluation of this work.

The second requirement of the GTO complex--to stay in the gas mask for an hour or 30 minutes with a physical load--was also accomplished in different ways. If, in the VIVR, this standard was accomplished on the ground and in movement over a specific route, at the "Proletarskaya pobeda" factory it was considered unnecessary altogether. In the Central Design Office for Petroleum Equipment and at the Podol'sk machine-building plant, the time spent working in gas masks at drills which are practiced here was counted toward the passing of the standard.

Familiar Motives

Is it possible that the entire matter is carelessness in the recommendations by which they are guided in taking the GTO standards? How else can we explain the existing notion that there is no difference either in the essence or in the procedure for taking them between the practical standards of the 20-hour program and the GTO standards?

Nine years ago, when the editors of the journal VOYENNYE ZNANIYA conducted a "raid" in connection with the taking of the civil defense standards of the GTO complex, this thought was present in the statements of the most diverse persons. But you see, much has changed since then and new recommendations have been adopted. Then why are the familiar motives heard as formerly?

It is believed that in 1974, when the new recommendations were being worked out, the matter was not carried through. In particular, having rescinded the former eight gradations in age and education and thereby regularizing noticeably the taking of the GTO standards, unfortunately they did not take the next step--they did not determine the mandatory standards to be passed just as clearly. And it was absolutely necessary to take it because of the 20 standards of the 20-hour program recommended for accomplishment, almost half "fit in" the GTO complex.

What was the result of such vagueness? On the one hand, the arbitrary selection of the notorious "two or three standards" (at that time wasn't it better to think them out and determine them ahead of time in the recommendations?). On the other hand,

there occurred an obvious "eroding" of GTO work which, in essence, dissolved in measures conducted within the framework of instruction in civil defense and is now limited to purely training forms. For the present, it is devoid of a sports spirit and rivalry.

Of the four installations of the national economy which I had the occasion to visit, not one practices the taking of the GTO norms under competition conditions. Meanwhile, both in Mytishchi and in Podol'sk their training is checked in competitions not only in voluntary aid detachments and stations, but also in reconnaissance, communication, and fire-fighting formations. This means that the necessary experience is here.

Is it possible to give the work on the GTO complex a more competitive and sports nature without increasing the number of "measures" and without chasing numerical indices? Most likely, there is such a possibility.

Let us say that ski competitions for the best shop team and individual championship are taking place at the "Proletarskaya pobeda" factory and the Podol'sk machine-building plant. The skiers travel half the route in gas masks--there is passing the GTO standard for you. On 27 June, on Soviet Youth Day, a youth KVN [club of the jovial and the resourceful] is being conducted in the factory's House of Culture. One of the tasks is to don the gas mask and protective suit; here both speed and quality are graded. And the traditional meeting of tourists in the VIVR--perhaps reserves are also here.

Unfortunately, a sports direction in GTO work has not become predominant and, moreover, it is hardly considered. Preference is given to the purely training form of summing up results--to the test. However, if we consider the 20-hour program, including the working out of its standards, as only the base and preparatory stage on the path to the passing of the standards of the GTO complex, it should be acknowledged that competitions or other measures equal to them are necessary.

Judging from everything, the insufficient definiteness of the recommendations and the possibility of different interpretations of the same requirements disoriented our readers in some measure. They understood the reference to the fact that the standards of the GTO complex are identical to the standards of the 20-hour program as permission to limit themselves to working out only the 20-hour program standards.

And Who Are the Judges?

This question, which stands out in the subheading, is in no way rhetorical. Now each one answers it in his own way. Let us say, in the VIVR tests on civil defense and GTO standards are given by a commission consisting of the installation CD chief of staff and his assistant, and representatives of the Komsomol and DOSAAF committees, the Red Cross, and the sports public. In which regard, in all training groups only personnel of the civil defense staff were permanent personnel. At the "Proletarskaya pobeda" factory one or two members of the commission and the leader of the lessons participated in giving the tests. Work was organized in accordance with approximately the same principle in the Central Design Office for Petroleum Equipment.

At the Podol'sk machine-building plant imeni Ordzhonikidze the taking of tests and standards is organized by the shop chief. He, together with the secretary of the party organization, the chairman of the shop committee, and the shop CD chief of staff, signs the report.

In the latter case, the overall evaluation of the work and the results of each one depend to a great extent on the leader of the structural subunit and his knowledge, of civil defense questions, demandingness toward subordinates, and simply his objectivity.

"Are any other forms for monitoring GTO work at an enterprise similar to yours possible, at which it is physically impossible for one plant-wide commission to give all tests and standards?" I directed the question to the assistant director for civil defense, M. Napurin, and the senior engineer for civil defense, M. Mikhaylov.

"For example, the check of one shop by representatives from other shops, in short, not a self-inspection but a mutual inspection?"

"This is possible in principle," he answered, "but so far we have not practiced it."

Here is one more question which requires clarity. I recall that according to the existing statute the judges' apparatus for grading the GTO standards should be created from the commanders of formations and leaders of lessons who have undergone training at civil defense courses and from medical personnel.

And nevertheless, if we evaluate everything seen on this trip, it should be said that work is actually in progress and much has already been done. Each of the installations of the national economy mentioned above has its own achievements of which it can be proud and there are people who are working with spirit and with a sense of very great responsibility for the assigned matter. And there will be more and more such people.

Work is proceeding, and with each year it acquires a more and more specific nature and is directed toward the achievement of the final result--to teach the entire population of the country and each person individually the procedures and methods for protection against contemporary weapons.

Work is proceeding but, for the present, it has a remote relationship to the GTO complex in its forms and methods. It is believed that the situation must be changed, for the GTO complex is one of the important levers in raising the quality of training of the population in civil defense.

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DOSAAF AND MILITARY COMMISSARIATS

LECTURE ON WORKING WITH DOSIMETERS

Moscow VOYENNNYYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) pp 26-27

[Article by V. Oreshin, methodologist of the Moscow City Advanced Training Institute for Teachers: "Work With Instruments"]

[Text] On the first lesson on the subject, "Radiation and chemical reconnaissance instruments and instruments for dosimetric monitoring," it is desirable to provide at least a brief definition of the concepts of radiation and chemical reconnaissance and dosimetric monitoring. Otherwise, the students will have a vague idea of the instruments' purpose and will not catch the meaning of their employment in various cases.

Announcing the title of the subject, the military instructor next explains that radiation and chemical reconnaissance is a system of measures which are conducted to disclose the scales and degree of radioactive and chemical contamination of the terrain, air space, water area, and various objects. The task of dosimetric monitoring is to determine the radiation doses received by the troops and population as well as the degree of radioactive contamination of weapons, equipment, food, water, materiel, and so forth. All these data are necessary to estimate the fitness for work of people under conditions where the enemy has employed nuclear and chemical weapons and to adopt the appropriate decisions.

The students became acquainted with such concepts as radiation dose, radiation level, and degree of radioactive contamination of the terrain earlier when studying the subject, "Characteristics of the weapons of mass destruction of the armies of the imperialist states." On this lesson, by means of questioning the military instructor is convinced that the students have not forgotten the material which has been covered.

In beginning the explanation of the new material, the military instructor stresses that radioactive substances and their emissions, possessing considerable injury-causing properties, have neither odor nor color. "Then how can they be detected and, what is more, measured?"--he asks the students and proposes that they recall the material studied in physics lessons in the ninth grade, "Electric current in gases." The method for the detection and measurement of radioactive substances which is used in the instruments is based on the ability of radioactive emissions to ionize the medium in which they are propagated. And that is why they are called "ionization."

We note that turning to other disciplines not only saves time in the explanation of one or another training problem and facilitates the students' assimilation of the most difficult concepts. It molds in them the ability to consider specific facts not in isolation but in their interconnection and interdependence and it trains them to mobilize all accumulated knowledge, abilities, and skills for the accomplishment of practical civil defense tasks.

For this purpose the military instructor proposes to the students that relying on the knowledge obtained on physics lessons they prepare a block diagram of the structure of dosimetric instruments together. The diagram presented in Figure 129 of the school textbook serves as a check.

It should be said that some military instructors explain the construction of the ionization chamber and gas-discharge counter in too much detail and spend precious time on this. Meanwhile, the knowledge of an electric current which the students received on physics lessons is fully sufficient for the rapid understanding of the operating principle of dosimetric instruments. Moreover, it is undesirable to expand the theoretical part of the lessons through a reduction in the time for practical work with the instruments. It is believed that those military instructors proceed correctly who already on the first lesson, in speaking about the construction of dosimetric instruments in general, direct the attention of the students to some of the special features of a specific model.

The construction of the DP-5A radiometer-roentgenmeter and the procedure in caring for it are set forth in a rather detailed manner in the textbook. Preparation of the instrument for operation and measurement of radiation levels are discussed in it in more compressed form. With consideration of this, the following procedure for working out training problems is proposed.

Two squad leaders who have been trained in working with the instrument earlier are invited to the teacher's desk. The military instructor has all students make notes from his dictation on safety rules when working with monitoring radioactive preparations of dosimetric instruments as well as on the procedure to prepare the DP-5A for operation and determine radiation levels and the degree of radioactive contamination. At this time, the squad leaders perform the practical performance of that about which the military instructor speaks slowly so that all are able to write it down. At the same time, the students observe the actions of their comrades at the teacher's desk. After this lesson, an abstract remains with each of them which will help them in practical work with the instrument. A typical example of it is presented below (for convenience in use the notes are written in the first person).

1. Preparation of the DP-5A for operation. I remove the instrument from the stowing box. I withdraw the measurement panel and probe from the case. I conduct an external inspection of the entire instrument and satisfy myself that there is no mechanical damage. I connect up the telephones. I place the switch of the subbands in the "Off" position. I turn the "Mode" knob in the counterclockwise direction as far as possible. With a screwdriver I unscrew the collector plug and set the mechanical zero of the microammeter. I open the power supply compartment and, observing the polarity, I place three 1.6-PMTs-U-1.05 dry elements in it. I close the lid of the power supply compartment and turn up the fastening screws.

2. Setting the operating mode. I place the subband switch in the "Mode" position. I smoothly turn the "Mode" knob in the clockwise direction, setting the needle of the microammeter on the triangular mark of the scale (if the needle is not deflected or does not reach the triangular mark I check the reliability of the contacts for connecting the power supply). I stow the measurement panel in the case.

The students also make such notes concerning the procedure for checking the serviceability of instrument.

Concluding the presentation of this problem, the military instructor stresses that the DP-5A should be prepared for operation not only precisely in accordance with the instructions, but also rather rapidly. In order to accomplish the standard with an excellent grade, it is necessary to accomplish it in 6 minutes, for a good grade in 8 minutes 30 seconds, and for a satisfactory grade--in 10 minutes.

Two questions should find reflection in the notes headed, "Measurements Using the DP-5A": the measurement of radiation levels on the ground and the measurement of the degree of radioactive contamination of various surfaces, friable materials, and water. The question may arise: is there enough time for all this? Naturally, one lesson is not enough. But the military instructor has three lessons at his disposal to prepare the students for subsequent practical lessons, and he has the right to use them proceeding from considerations of expediency.

The instruments for monitoring radioactive irradiation are studied on the second lesson. In beginning the presentation of the new material, the military instructor recalls that the injury of people by ionizing emissions may occur as a result of external and internal irradiation. External gamma radiation presents the greatest danger. Sets of individual dosimeters serve for measuring doses of radioactive irradiation.

Showing the DP-22V set of individual dosimeters, the military instructor explains that it consists of a ZD-5 charging device and 50 DKP-50-A direct-reading dosimeters. The dosimeters are used to measure doses received within a range of from 2 to 50 R. The charger is intended to bring the dosimeters to operating condition.

Using posters and individual frames from a film strip, the military instructor acquaints the students with the operating principle of the DKP-50-A and the ZD-5. On the first lesson, they learned that one of the basic parts of the dosimetric instrument is the radiation detector. In the DP-22V a small ionization chamber serves as the detector. Connected to it is a capacitor with an electroscope (their construction is known to the students from physics lessons) which permit measuring the amount of the irradiation dose. A crosshair serves for recording the readings, and its image moves along a scale of a counting microscope. In order to take a reading, it is necessary to direct the dosimeter toward the light and to read the dose in roentgens.

The military instructor shows the procedure to prepare the charger for operation and charging the dosimeters. Then he issues to the students several not completely charged dosimeters, first recording their numbers and readings, and he has them take readings. If the readings agree with the notes of the military instructor, it can be considered that the students have mastered this training problem.

In conclusion, the military instructor stresses that the monitoring of irradiation is conducted to obtain timely data on absorbed doses of irradiation. The fact of the effect of ionizing emissions is established or confirmed from these data.

The monitoring of irradiation may be group or individual. With group monitoring, dosimeters are issued on the basis of one per team and one or two per group of 14-20 persons; here, the mean irradiation dose is determined for the indicated groups.

Individual monitoring is conducted to obtain data on the irradiation doses of each person. They are necessary for the initial diagnosis of the degree of severity of acute radiation sickness. Such monitoring is conducted in medical institutions. In this case, dosimeters of the ID-11 type are issued to each person.

The third lesson is devoted to a study of the troop chemical reconnaissance instrument (VPKhR). This question is presented rather completely in the textbook. Therefore, the article discusses only that which is absent in the textbook or is poorly assimilated by the students. Basic attention should be concentrated on preparation for subsequent practical work with the instrument.

Telling briefly about the construction of the instrument, the military instructor shows the procedure for determining OV [toxic chemical agents] with the assistance of previously trained squad leaders, and the students take notes in their notebooks using the same scheme as on the first lesson, that is, in the first person.

First he explains how to determine OV in dangerous concentrations. Even if no OV is discovered here, measurements should not be stopped. It is necessary to determine whether or not toxic chemicals are in the air in dangerous concentrations. In this case, it is necessary to accomplish 30-40 shakes rather than 5 or 6 to pump air through the testing tube. In addition, the lower ampoules should not be broken at once, but two or three minutes after pumping the air through. If by the moment that the filler of the monitoring tube turns yellow the testing tube preserves a red color, this means that toxic chemicals are in the air in concentrations which are dangerous for staying for more than 10 minutes without a gas mask. A change in the color of the testing tube to yellow or rose-orange indicates the presence of OV in virtually safe concentrations and is the basis for removing the gas mask.

Independently of the readings obtained, using the indicator tube with three green rings the presence of non-persistent OV in the air is determined--phosgene, cyanogen chloride, and prussic acid, while mustard gas vapors are determined using the tube with the yellow ring. The students also record the work procedure demonstrated by the military instructor in their notebooks.

Then the military instructor explains the procedure for actions when determining OV on the ground, on weapons, and in the air with low temperatures. In the latter case the sensitivity of the indicator tubes is reduced; therefore, a heater is envisaged in the VPKhR to heat the tubes with the red ring and the red dot at negative temperatures and with the yellow ring at a temperature below +15°C. For this, it is necessary to insert the cartridge in the central socket of the heater. By striking the head of the pin with the hand, the ampoule located in the cartridge is broken (the appearance of vapor indicates the normal operation of the heater). Two tubes with a red ring and a red dot are placed in the side sockets

of the heater. After the tubes have thawed out, remove them from the heater, break the upper ampoules, shake them energetically two or three times, and pump air through the testing tube (five or six shakes). Warm both tubes in the heater for one minute, after which break the lower ampoules and shake simultaneously. Observe the change in the coloring of the tubes' filler.

The program also mentions such a question as the organization of chemical monitoring. It is important that the students assimilate the fact that chemical monitoring is a system of measures. It is organized to determine the presence and kind (type) of toxic chemicals as well as the degree of contamination danger. Chemical monitoring is accomplished by special-reconnaissance subunits and CD formations equipped with radiation and chemical reconnaissance instruments as well as by chemical laboratories.

The fourth through sixth lessons are exceptionally important when studying the ninth subject. All students should learn to work with the instruments, consolidate their abilities and skills, and accomplish the standards "Preparation of the DP-5 instrument for operation" and "Determination of toxic chemicals in dangerous concentrations."

The experience of the Moscow schools convinces us that it is expedient to create three or four training sites (according to the number of squads) in the classroom for the successful conduct of the lessons. The squad leaders should be briefed ahead of time. If the school is not completely supplied with authorized equipment, it is necessary to supplement it, even if temporarily, by resorting to the help of the rayon CD staff or adjacent schools. It is desirable to have two DP-5A instruments, two VPKhR's, and one DP-22V for a training group. They can be distributed as follows.

On the fourth lesson the first squad (at the first training site) works with the DP-5A and VPKhR, the second squad-- with the same instruments, and the third--with the DP-22V. On the fifth lesson the second and third squads exchange instruments, and on the sixth the "breakdown" is as follows: the DP-22V is at the disposal of the first squad, and the DP-5A and VPKhR--of the second and third squads.

The question may arise: why not distribute the instruments differently, for example, supply one training site with two DP-5A's and the second with two VPKhR's? The fact is that the time spent on the practical study of these two instruments is different. As a result, when one squad is already concluding its work the other has it only half done, and this means that it will not be possible to change training sites. In the proposed version, those similar instances and, consequently, standing idle are excluded.

In order to prevent possible idle standing, it is recommended that a third training site be organized--with the DP-22V, although the program envisages working only with radiation and chemical reconnaissance instruments. It is also expedient to have individual protective equipment at each training site. First, in a combat situation, as a rule work with the instruments is conducted in protective equipment. Second, the students have the opportunity to drill once again in gas masks and to consolidate the skills which have been acquired.

How is work organized at the training sites under the condition where, as a rule, each squad consists of 10 or more people? At the first and second training sites

two students work with the DP-5a and two with the VPKhR. Here, one performs all the actions and the other observes, preparing for independent work. Altogether, eight people are occupied with the instruments. The remainder, divided into pairs, drill in putting on the individual protective equipment by way of self-monitoring. Then the pairs change places.

At the third training site, where there is the DP-22V, the organization of the work is approximately the same as on the second lesson. During the time when they are not taking readings the students improve their skills in putting on the gas mask.

Recommended literature (in addition to the school textbook) and visual training aids: N. P. Olovyanishnikov. "Grazhdanskaya oborona" [Civil Defense]. Textbook for vocational and technical schools, Moscow, Vysshaya shkola Press, 1978, pp 43-52; "Grazhdanskaya oborona" [Civil Defense]. Textbook edited by N. O. Olovyanishnikov, 2d edition, Moscow, Vysshaya shkola Press, 1979, pp 56-59; "Uchebno-metodicheskoye posobiye po nachal'noy voyennoy podgotovke" [Training-Methods Aid for Primary Military Training], Moscow, Prosveshcheniye Press, 1981, Chapter 8; "Tablitsy po grazhdanskoy oborone dlya IX klassa" [Tables on Civil Defense for the 9th Grade], Moscow, Prosveshcheniye Press, 1979; Filmstrips "Roentgenmeters-Radiometers and Radiometers," "Set of Individual Dosimeters," and "Chemical Reconnaissance Instruments and the Procedure for Working with Them."

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DOSAAF AND MILITARY COMMISSARIATS

USSR DEPUTY EDUCATION MINISTER, DOSAAF PRESIDUM CC MEMBER, ON YOUTH MILITARY TRAINING

Moscow VOYENNYE ZNANIYA in Russian No 9, Sep 82 (signed to press 6 Aug 82) pp 36-37

[Article by F. Shtykalo, USSR deputy minister of education, member of DOSAAF Central Committee Presidium: "Reserves for Improvement"]

[Text] The main force of the Soviet Armed Forces is their personnel who are boundlessly devoted to the party and the people. The high evaluation of the soldierly labor of the Soviet servicemen which was given by the 26ty Party Congress is, to a certain degree, also an evaluation of the work of the secondary general educational schools within whose walls the future defenders of the motherland are studying.

"The high level of technical equipping of the Armed Forces imposes serious demands on the quality of training of the draftee personnel.... In this regard, an important role is played by primary military training which, in accordance with the Law of the USSR on the Universal Military Obligation, the youths undergo in the schools, technical schools, and academies, at training centers of enterprises, institutions, kol-khozes, and sovkhozes, and in DOSAAF organizations. Practice shows that young people who have undergone such instruction join in the general rhythm of military service more rapidly, master combat equipment and weapons more successfully, and become experts of combat and political training and rated specialists," stresses the Chief of the General Staff of the Armed Forces and First Deputy Minister of Defense of the USSR, Marshal of the Soviet Union N. Ogarkov.

We receive many letters in which commanders and political officers of troop units and large units thank the schools and military instructors for the good training of the graduates, today's young soldiers. But, naturally, not all reserves for their improvement have already been used.

Changes in the program had a favorable effect on the quality of NVP [primary military training]: the knowledge of the students increased in the last training year. At the same time, shortcomings are permitted to which the most serious attention must be directed.

Violating the requirements of the program, some military instructors often conduct double lessons, as a result of which the material is poorly assimilated by the students and a logical sequence in studying sections and subjects is not observed. In a number of regions of the RSFSR, 10th-graders were not on three-day field lessons, did not fire the assault rifle, and did not work out in a practical manner some

subjects in tactical training and marching drill, military topography, and civil defense [CD]. The students of individual Moscow schools did not become familiar with armaments and combat equipment of a troop unit. Nor did practical lessons take place with girls in medical facilities in accordance with the program for medical-sanitation training in Stavropol and Krasnodar krays, either. But you see, the NVP program is a state document for the complete and exact accomplishment of which both the principal and the military instructor bear responsibility.

Checks show that the majority of the military instructors prepare for lessons thoroughly and make wide use of graphic aids and technical means of instruction. Unfortunately, however, there are other facts: lessons in NVP take place at a low methodological level, military instructors know the content of the training material poorly, practical working out is often replaced by theoretical narrations, and graphic aids with which the military offices are equipped are used timidly. In presenting new questions, some comrades limit themselves to restating the textbook or dictation of the corresponding articles of regulations and manuals, do not always display the proper demandingness toward the students' observation of rules of conduct, and do not instill in them the skills of discipline and organization. The overstating of grades is permitted, which creates a picture of false well-being and inflicts tremendous moral harm as well as forming a flippant attitude toward the mastery of the foundations of military affairs.

As is known, the subjects "Combating tanks and armored vehicles of foreign armies," "Means of air attack of foreign armies," and "Engineer obstacles" are worked out in the program. It would appear that the military instructors should pay special attention to namely these. But this did not occur.

Many shortcomings are also encountered in the organization of firing training. The school children are assimilating poorly the purpose and operating principles of the parts and mechanisms of the AKM [modernized Kalashnikov assault rifle], the rules for employment and combat properties of hand grenades, and the procedure for cleaning and lubricating the weapons. But preparatory exercises using the small-caliber rifle are accomplished in all secondary schools.

The program envisions more time for the study of the regulations of the Soviet Armed Forces. But nevertheless, there are many examples which show that the rules of military courtesy and behavior of the servicemen, the duties of the orderly and sentry, the essence and significance of military discipline, and the duties of the servicemen in its observance are being assimilated superficially by the students. Nor are military sports games used for the deepened study of the requirements of the regulations.

It can be said without exaggeration that marching drill disciplines the students most of all. Therefore, more time is now also allotted to it. In addition, many marching procedures can and should be worked out on lessons in physical culture. The effective use of NVP lessons and lessons in physical culture will bring excellent results, and dozens and hundreds of schools serve as an example of this. But for the present, noticeable shifts are not being observed in the improvement of drill training in a number of places. Upper classmen operate unskillfully in front of and in formation, render the military salute and march to attention just as unskillfully, and so forth. In no way can this be tolerated.

As envisaged by the documents, the military instructors who are reserve and retired officers should come to lessons in NVP in military uniform. The procedure for its acquisition at half price has also been determined. However, there still are comrades who, referring to various reasons, do not acquire the uniform and conduct lessons in civilian clothes. This, to put it mildly, is an example of the teacher's indiscipline. Republic ministries, oblast departments of popular education, and military commissariats should eliminate such instances.

It is pleasing that base schools on civil defense have been or are being created in the cities and rayons and the organization-methodological level of lessons on CD and of various mass measures which propagandize knowledge and skills in defense against weapons of mass destruction was raised. But nevertheless, there are also omissions here. Let us say, according to the program about half of all the lessons in civil defense in the 9th and 10th grades are practical lessons. However, this requirement is violated in individual schools. Military instructors do not use training gas masks and respirators for drills, and the pupils are not preparing cotton gauze bandages. This is why, at times, the youngsters master poorly the skills in the practical employment of individual protective equipment and do not meet the standards.

NVP and the military-patriotic indoctrination of the future defenders of the socialist fatherland are inseparably connected with the thorough study of the Russian language in national schools. An especially large step forward in this direction was taken in the year of the 60th anniversary of the formation of the USSR. Study groups and optional courses are being created or have already been created for senior classmen. Dictionaries of military terms and methodological recommendations for military instructors of national schools in improving the teaching of NVP in the Russian language have been published in the Uzbek, Kazakh, Georgian, and Moldavian SSR's. In 1981 the "Prosveshcheniye" [Education] Publishing House published the textbook "Russkiy yazyk" [Russian Language] for draftees.

At the same time, it must be stressed that in some republics this important work has not yet received proper development. Lessons in study groups of the Russian language are poorly monitored by school principals, are conducted irregularly, and their quality is low. Cases occur where individual sections of the NVP program are studied in the national language.

The process of primary military instruction is inseparable from the military-patriotic indoctrination of the youth. It, let us note, is the obligation of all teachers, and in the majority of the schools the teaching collectives take a most active part in all measures. However, the main figure in the organization of training and extra-class military-patriotic work was, is, and remains the military instructor. On the lessons, many of them make skillful use of the materials of the 26th CPSU Congress, the works of Comrade L. I. Brezhnev, the basic provisions of the Soviet constitution, and examples from the heroic past of our motherland and from the life and combat training of the Soviet servicemen of the 1980's and they lead DOSAAF study groups. Conferences, talks, lectures, military-sports games, the viewing of films, trips to the places of revolutionary, combat, and labor glory of the Soviet people, participation in the All-Union research expedition "Chronicle of the Great Patriotic War"--this is far from a complete list of what is encompassed by the system of military-patriotic indoctrination in the country's schools.

On the basis of materials collected by the Red pathfinders, tens of thousands of museums, halls, rooms, and corners of revolutionary, combat, and labor glory have been created, and of them about 7,000 meet the requirements of public museums. These are genuine centers of military-patriotic work.

All-union reviews devoted to the most important events in the life of the party and the country have become traditional. This year the Ministry of Education of the USSR, the DOSAAF USSR Central Committee, and the Soviet Committee of War Veterans announced an all-union review-competition on the military-patriotic and international indoctrination of the school students which is dedicated to the 60th anniversary of the formation of the USSR.

The 40th anniversary of the outstanding victories of our Armed Forces over the German-fascist aggressors in the decisive battles of the Great Patriotic War will be marked in 1982-1984, and in 1985 we will celebrate the 40th anniversary of the great Victory of the Soviet Union over fascist Germany. The USSR Ministry of Education has worked out and distributed to the localities a typical plan of measures devoted to these important dates. It is the task of the organs of popular education and of inspectors and methodologists to make it available to each school and to do everything for the accomplishment of what has been planned.

The improvement of NVP and the military-patriotic indoctrination of the students depends to a decisive degree on the military instructors and on their ideological-political maturity, pedagogical skill, professional training, and conscientious attitude toward their duties. During recent years, many successes were attained in the selection, training, and raising of the qualifications of the military instructors of schools and pedagogical academies. Now 72 percent of them are reserve officers, 52 percent have a higher education, and 10 percent have an incomplete higher education, while one out of every five passed through the fire of battles of the Great Patriotic War.

The picture as a whole appears favorable. However, it should not be forgotten that in many rural schools sergeants and privates of the reserve are working as military instructors and do not have a military and pedagogical education. The main reason for such a phenomenon is that the chiefs of departments, NVP inspectors, and rayon military commissariats do not send such comrades to training assemblies for the training of reserve officers and are not concerned that they study in pedagogical institutes.

There still are schools in which there are no authorized military instructors and people holding two jobs are working. They do not conduct extra-class work on NVP and military-patriotic indoctrination. The departments of popular education and military commissariats should solve this problem without delay. The activity of methodological associations on NVP in the rayons and monthly methodological lessons must also be constantly kept at the center of their attention. Each military instructor should be granted one day per week for the independent improvement of his professional and pedagogical knowledge.

Courses to raise qualifications with the teachers' institutes for professional improvement remain the most important element in the system for training military instructors, and comrades should be sent to them at least once every five years.

Many of them have completed these courses twice. However, some teachers' institutes for professional improvement [IUU] are reducing the number of military instructor-teachers groundlessly, which is fundamentally incorrect and requires rapid correction.

The training material base of the secondary general-educational schools basically ensures the accomplishment of the NVP program in all its sections. It was noticeably improved with the assistance of party, soviet, Komsomol, and DOSAAF organizations. Military offices and rooms for the storage of weapons as well as areas for practical instruction have been set up everywhere, as a rule. Civil defense classrooms, shelters, and very simple cover have been created in base schools on civil defense. Almost half the country's schools have shooting galleries and one out of four has a complete NVP training-material complex (including shooting galleries).

But along with these favorable facts, we cannot wave away the fact that in some places the equipment and improvement of the training-material base for NVP lags behind urgent requirements and NVP inspectors and methodologists of a number of republics do a poor job of monitoring its status and do not render proper assistance to the schools. Attention to the equipping of military offices has been weakened. At times, new provisions of the Soviet constitution concerning the obligations of citizens for the defense of the motherland and changes introduced in 1975 in the text of the Statute on the Battle Standard of the Troop Unit and in the composition of the Soviet Armed Forces' high command are not considered in their graphic makeup.

In conclusion, I should like to repeat: the secondary general-educational schools have made and are making a large contribution to the training of worthy replacements for the Armed Forces. Nevertheless, everything presented above shows how great are the reserves for the further improvement of primary military training and military-patriotic indoctrination and how much remains to be done so that yesterday's schoolboys, joining the soldierly formation, often recall their teachers who, even before call-up, helped them in mastering soldierly science, gratefully and warmly.

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DOSAAF AND MILITARY COMMISSARIATS

LECTURE OUTLINES COMBAT PROPERTIES OF T-72 TANK

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[Article by Engr-Col V. Knyaz'kov: "The T-72 Tank"]

[Text] What is a tank? Encyclopédias give a clear definition: "A tank is a tracked combat vehicle with high trafficability, completely armored, and with armament for the destruction of various targets on the field of battle." This means that it is not by chance that the son of the famous chemist, D. I. Mendeleyev, who was the first one in Russia to propose several plans for armored combat vehicles, accurately called them "land cruisers."

In fact, the combat properties of the tank confirm this name. Among them, the most important are firepower, armored protection, and trafficability. Exceptionally great significance is had by the tank's ability to execute marches over long distances and to overcome obstacles and barriers. The T-72 tank meets these requirements completely.

Soviet designers succeeded in creating a "land cruiser" which successfully combines within itself high firepower, high maneuverability, and reliable armored protection. The T-72 tank is truly a formidable combat vehicle. In which regard, it is not only a powerful striking means, but also a unique mobile shelter for the crew against the effect of the damage-causing factors of a nuclear burst.

The main weapon of the T-72 tank is the 125-mm smoothbore tank gun. There are also a 7.62 machinegun coupled with the gun and an antiaircraft mount with a 12.7-mm machinegun which is placed on the commander's turret. The tank gun is intended for firing at enemy tanks and self-propelled artillery mounts and other armored targets, for the neutralization of his various weapons including antitank guided missiles, and for the destruction and neutralization of artillery and personnel. Therefore, the tank gun also possesses the appropriate tactical characteristics and specifications which permit the crew to accomplish various fire missions successfully in battle regardless of the time of day.

The tank gun is equipped with an infrared sight.

When firing with an armor-piercing composite projectile, the point-blank range reaches 2,100 meters.

Firing can also be conducted from the T-72 tank from an indirect firing position to a range of up to 9,400 meters. HE fragmentation shells are used in this case;

The loading of the gun is accomplished separately. For example, an HE fragmentation round weighing 33 kilograms is first fed into the powder chamber, and then the cartridge case with the powder charge and the igniter. All these operations are accomplished by an automatic loader. The human hand touches neither the shell nor the cartridge case. In this way, the actual rate of fire is increased.

The requirement for a loader disappeared in the T-72 tank. Figuratively speaking, his place was taken by a robot. This is why the crew consists of only three men: the commander, gunner, and driver-mechanic. The commander and gunner are located in the fighting compartment which is located in the middle portion of the tank and is separated from the engine compartment by a bulkhead. The commander's place is to the right of the gun, and the gunner's--to the left. The driver-mechanic is located in the driving compartment. The layout of the tank as a whole and some of its structural features provide the crew members with the capability to move from one compartment to another.

Let us examine how the tank gun is constructed. Its basic parts and mechanisms are: tube, breechblock with semiautomatic devices, cradle with counterrecoil mechanisms, aiming mechanisms, and cartridge case deflector with trigger mechanism. They perform the same functions as on an artillery piece. The differences may be only of a structural nature.

The tank gun is stabilized in two laying planes. What does this mean? Let us imagine that the gunner has discovered a target and lays the sight crosshair on its most vulnerable point. For this, he smoothly rotates the handwheel of the laying mechanism. Ready! And then from this instant a special device--it is called a stabilizer for short--fixes and, saying it simply, "memorizes" the laying of the gun and keeps the tube in this position. The most interesting thing is that at this time the tank can do whatever it wants: stand in place, move forward or backward, turn to the right or to the left. Thus, firing can be conducted from the gun of the T-72 tank on the march, during movement, that is, to fire an aimed round it is not necessary to make a short halt and turn the combat vehicle into a fixed target.

The machinegun which is coupled with the gun is designed by Kalashnikov--the PKT. Its greatest aimed range is 1,800 meters. Its rate of fire is up to 250 rounds per minute. It has a belt feed with 250 cartridges in the belt.

The antiaircraft machinegun mount has a caliber of 12.7 mm. It is general purpose: fire can be conducted against aerial as well as ground targets. Here, the greatest aimed range of fire at aerial targets is 1,500 meters, and at ground targets--2,000 meters. The rate of fire is 680-800 rounds per minute.

In acquainting the readers with the tank armament, we should also call attention to the numerous observation and aiming instruments. These very names tell us that using optical and other instruments the tankmen, being in the combat vehicle with each one at his place, can conduct terrain reconnaissance, discover targets, and destroy them with cannon and machinegun fire.

Special sights and night vision instruments have been installed in the T-72 tank which permit the conduct of observation and aiming under nighttime conditions. The vehicle can move and conduct fire at night no worse than during the day.

Shellproof armor is employed on the T-72 tank which reliably protects the crew and mechanisms not only against fragments and bullets, but also against the effects of shells.

The basic indices which characterize the mobility of the tank are average speed of movement and range. Average speed of movement of the T-72 tank over an unimproved road is 35-45 kilometers per hour, and over a highway--up to 50 kilometers per hour. Maximum speed may reach 60 kilometers per hour. The range, according to the fuel, fluctuates within limits of from 320 to 480 kilometers. If movement is accomplished over a highway, the range may be increased to 500 kilometers.

The tank's maneuverability can be judged from how quickly it can change direction of movement. The driver-mechanic brakes one track and the other, winding, turns the vehicle. This happens very quickly. The tank can turn almost on one spot.

And can the tank move over sand dunes of the desert or virgin snow, over swampy terrain or deep plowed fields? Which obstacles can it "take" from the march, and which not? These questions must be answered by considering such a component of maneuverability as trafficability.

The weight of the tank is 41 tons and, at the same time, the mean specific pressure on the ground does not exceed 0.83 kilograms per square centimeter. A grown person exerts approximately the same pressure on the ground. So that the first and extremely substantial conclusion which can be drawn is that the tank can move cross-country. This, by the way, is also permitted by the amount of clearance which is 470 millimeters.

The T-72 tank can boldly go uphill if the angle of rise does not exceed 30 degrees. Here, the angle of bank in both directions may be up to 25 degrees. The tank can also cross a ditch or another such obstacle with a width of no more than 2.6-2.8 meters. It can take a vertical wall up to 0.85 meters in height. The maximum power of this tank's engine is 780 horsepower.

But here the tank has reached a river. What is to be done? If the scouts report that the depth of the ford is no more than 1.2 meters, the tank may move forward boldly and cross this water obstacle without any preliminary preparation. And what if the depth is greater, for example three to five meters? This means that it is necessary to prepare the OPVT [underwater tank-driving equipment]. The vehicle will move along the river bottom beneath the water, and above its surface will "protrude" an air-feed pipe with the aid of which the air is fed to the occupied compartments for the crew members and to the engine compartment--to ensure operation of the engine. The crew requires 20 minutes to install the air-feed pipe and perform other preparatory operations.

The question arises: and how quickly will the tank be able to go into battle on the opposite bank, for if the enemy has dug in won't the enemy strike point-blank? The designers found the necessary solution. As soon as the tank reaches the bank

after crossing the obstacle, it is already ready to open fire on the enemy from all armament in literally one or two minutes. For the combat vehicle has no need to stop nor must the crew leave it to conduct any additional work.

The T-72 tank can cross a water obstacle with a width of up to one kilometer beneath the water if, of course, its depth does not exceed five meters.

The T-72 tank also has equipment for digging itself in. This is bulldozer-type equipment. For example, in accordance with the situation the crew was required to dig a caponier 10 x 4.5 x 1.2 meters in size for the tank, that is, to move 54 cubic meters of dirt. The self-digging equipment is shifted from the travelling position to the operating position in one or two minutes. In this case, the tank operates like a powerful bulldozer. On sandy or sandy-loam soils it digs such a caponier in approximately 12 minutes, and on ground with plant cover and clay soil--in 20 minutes.

In concluding the story about the T-72 tank, it should be stressed that Soviet designers succeeded in creating a vehicle which meets the requirements of contemporary battle in full measure.

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DOSAAB AND MILITARY COMMISSARIATS

LECTURE ON NAVAL RADAR JAMMING

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[Article by Engr-Lt Col Ye. Klimovich, candidate of technical sciences, and Engr-Lt V. Kindeyev: "Ships Means for Electronic Jamming"; from foreign press materials]

[Text] The wide employment of electronic equipment by all services of armed forces in the course of combat operations led to where electronic countermeasures [ECM] against these means is now considered by foreign military specialists as an integral part of armed conflict.

According to the principle of their action on the electronic equipment [EE] being suppressed, contemporary ECM means can be subdivided into the following basic classes: means for active and passive jamming, means for optical-electronic counteraction, and special means for destroying the sources of electromagnetic emission.

Active ECM equipment (jamming transmitters) itself emits electromagnetic energy which masks, distorting (suppresses) useful signals reflected from the target or simulates false signals. Masking jamming lights up the screen of the radar scope and hinders target detection. With the action of simulation jamming on the screen of the radar scope a great number of false blips arise, among which it is difficult to distinguish the blip from a true target. Jamming transmitters are of non-expendable and expendable types. The latter are dropped in the disposition area of the EE being suppressed using various means of delivery.

Passive jamming means provide the reflection or absorption of useful signals emitted by the radar. They create false blips on the radar screens, mask the blips of actual targets, and detonate the radio fuzes of antiship missiles at a distance from the ship which is safe. The following are used as passive jamming: antiradar reflectors (chaff) in the form of metal strips of various materials or metallized glass fiber, corner or lens reflectors, decoy targets, antiradar coatings and radio-absorbing materials, aerosols, and so forth. Metallized nylon fiber or glass fiber is now used abroad widely as chaff instead of aluminum foil and metallized paper since the smaller diameter of the filaments of glass fiber permits placing considerably more reflectors in the very same volume.

Optical-electronic counteraction (OEC) means which also may be active and passive are intended for the jamming of television and infrared systems for guiding guided antiship weapons. Active OEC means create powerful thermal radiation whose intensity

exceeds the thermal radiation of the ship, and light flares (pulses), including laser emissions, which act on the operators' organs of sight as well as on light-sensitive instruments of antiship means of destruction to redirect them to this false emission or to light them up.

Passive means of counteraction against optical-electronic guidance systems include: aerosols (masking, scattering, absorbing), smokes, screening coatings, and so forth which decrease the emission of the targets being covered and mask them against the background of the environment. Now, the greatest dissemination has been received by thermal (IR) means of counteraction: IR jamming transmitters, IR tracers, IR decoy targets (traps), and means for IR masking.

To protect ships against guided antiship missiles with radar homing heads, various launchers are employed which fire free rockets with antiradar chaff from the deck of the ship to a certain altitude and distance. These rockets can fire IR tracers (decoy thermal targets). When these rockets are detonated around the ship, a cloud of chaff or a protective belt of IR granules which create false thermal emissions is formed around the ship. Materials on a hydrocarbon base with the addition of magnesium are used most of all as the fuel in IR tracers. Such a tracer emits thermal energy equivalent to the emission of a ship of averaged displacement. Another type of IR target decoy consists of aerosol formations which are obtained with the atomization, in the air, of a substance which is capable of oxidizing and releasing heat as a result of chemical interaction with the air, water, or other oxidizer.

The special destructive ECM means include guided missiles or remotely-piloted aircraft with a warhead and equipment for homing on a source which is emitting electromagnetic energy. Examined below are models of ECM equipment which are in the inventory of ships of the navies of developed capitalist states.

The British jamming transmitter "Scimitar" creates a frequency jamming band of 116 GTts [GHZ?-not further identified], has a continuous-mode radiative power of 200 W and in the pulsed mode of 600 W, and ensures creating various types of jamming. The foreign press reports on jamming transmitters of the RCM series. They are intended for the creation of effective jamming in selective and barrage modes against electronic observation, navigation, identification, and weapons control equipment. Transmitters of the RCM series operate in frequency ranges of 5-9.5 GTts or 9-16 GTts on a single or double antenna. The latter may be stabilized, which ensures great radiative power. Usually double antennas are installed on ships of the main classes (one antenna covers 180 degrees on the port side and the other 180 degrees on the starboard side). The composition of RCM series transmitters has a reconnaissance receiver for the instantaneous measurement of frequencies of electromagnetic signals being received, which permits tuning the frequency emitted by the jamming transmitter to the frequency of the EE being suppressed.

In accordance with the views of American specialists on the role and place of electronic warfare, all surface ships of the U.S. Navy are equipped with launchers which ensure the firing of free rockets (FR) with antiradar reflectors, which are considered to be one of the important means for defense against antiship missiles. Until recently, the armament of American ships included the "Chafroc" FR system which is a multicharge launcher for launching FR's having a short (up to 200 meters) and long (up to several kilometers) range. The rockets are filled with antiradar

chaff as well as with infrared traps. Free rockets with chaff are fired in the direction of the attacking antiship missile. After detonation, the free rocket creates a cloud of chaff which has a large effective reflecting surface (ERS). The homing head of the antiship missile may be redirected to this cloud and the detonation of its warhead may occur at a safe distance from the ship.

Light ECM systems of the grenade-launcher type have been developed to equip small ships and boats with the means for creating passive jamming. The Swedish ("Filaks") system includes two to four launchers (with a weight of 180 kilograms) and a supply of grenades with chaff of 144 grenades for each launcher which are placed in four magazines (36 in each). The magazine consists of four sections in each of which nine grenades are placed. All nine grenades of the section are fired simultaneously using one pyrotechnic cartridge. Each grenade creates a cloud of chaff with an ERS of 300 square meters at a height of 25-50 meters.

The British grenade-launcher-type launcher, the "Protean," is a nine-tube launcher which fires grenades with chaff (dimensions of the grenade: length--225 millimeters, diameter--40 millimeters). Five seconds after the salvo from the 9 tubes, a cloud of chaff is formed at a height of 40-60 meters which jams radars in bands of 5-10 and 15-20 GTts. Control of the launcher is accomplished in accordance with data from the ship's electronic intelligence equipment.

Recently, antiradar missiles (ARM) which are intended for destroying emitting ship- and shore-based radars have found broad application abroad. The "Shrike" AGM-54A and "Standard-ARM" missiles are now in the inventory of the U.S. Navy. They have a passive radar homing head and are equipped with a conventional warhead. The "Shrike" missile was widely employed during combat operations in Southeast Asia. It is noted that among its substantial shortcomings are short range of fire (in the killing zone of air defense weapons) and large misses when the high voltage is turned off at the radar. These shortcomings were partially considered when developing the "Standard-ARM" missile. This missile is equipped with a more improved guidance system which can "memorize" the direction to the emitting radar after it is turned off.

Simultaneously with the improvement of antiradar missiles, their field of application is also being expanded. The ("Braso") air-to-air antiradar missile intended for the destruction of interceptor fighters is being developed to arm the aircraft of carrier aviation. The foreign press also reported on the conduct of studies on the development of missiles which home on the spurious emissions of ships' electronic equipment. For this purpose, it is planned to create dual-mode homing heads which would home on the main and spurious emission.

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DOSAAF AND MILITARY COMMISSARIATS

DOSAAF, USSR CIVIL DEFENSE 50 YEAR COOPERATION HERALDED

Moscow VOYENNNYYE ZNANIYA in Russian No 10, Oct 82 (signed to press 13 Sep 82)
pp 4-5

[Article by Lieutenant General V. Mosyaykin, deputy chairman of the Central Committee of the USSR DOSAAF: "For Strengthening Cooperation"]

[Text] For 50 years Civil Defense and USSR DOSAAF in close cooperation have made a significant contribution to strengthening the defensive and economic might of our dear Motherland.

The Soviet people are confidently marching along the path shown by the great Lenin and the Communist Party. The workers of our multinational Motherland are celebrating the fifth anniversary of the current constitution of the USSR and the coming 60th anniversary of the formation of the Union of Socialist Republics with new successes in fulfilling the decisions of the 26th CPSU Congress.

Today we are strong as never before. It is precisely because of this that we can project such imposing economic and social programs as the Food Program, approved by the May Plenum of the CPSU Central Committee. Consistently fighting for an improvement in the international situation, we have come forward with such important initiatives as the promise of no first use of nuclear weapons. This is the first time in the history of mankind that such a unilateral promise was made and it was made public by the Soviet government at the second special session on disarmament of the UN General Assembly.

Unfortunately, the present leadership of the USA and their NATO allies do not want to listen to the voice of sane reason. In answer to the sincere peace-loving steps of the USSR, they have thus far not presented a single acceptable proposal for controlling the arms race. On the contrary, covering themselves with peaceloving words, the imperialists and their adherents are feverishly developing newer and newer programs for increasing military force and they are aiming the weapons of their aggressive policy against the USSR and the countries of the socialist community.

Taking all these facts into consideration, the Communist Party and the Soviet government are forced to strengthen their active, Leninist, peaceloving

policy of constant concern for increasing the strength of our country's defensive capability, for increasing the power and combat readiness of the armed forces of the USSR and improving our country's Civil Defense, which is marking its 50th anniversary at the beginning of this month.

Over a half century the CD of the USSR, as a component of the general state system of defensive measures, has been conducting a great deal of work in guaranteeing the protection of the Soviet people against weapons of mass destruction and other modern weapons of aggression of a possible enemy, and it has prepared industrial installations of the national economy to perform stable work under special conditions. The CD of the USSR, together with the USSR DOSAAF, participates in the military-patriotic training of workers.

Close cooperation and coordination of the defense society with the predecessor to the USSR Civil Defense, the MPVO, began with the very date of its birth on October 4, 1932. Osoaviakhim, already having accumulated a great deal of experience by that time in organizing the training of the population for protection against air and chemical attack, took upon itself the duty of training the workers and the staff of the MPVO and the on-site training of its command staff.

Together with the universal fulfilling of norms of the PVKhO and the GSO, the Osoaviakhim broadly developed the conduct of various competition and training of self-defense groups, the training of installation and sector commands in blackout procedures, the protection of the population in protective shelters, etc. Practical studies were conducted everywhere, extinguishing incendiary bombs, cleaning up rubble, giving aid to the suffering, and decontaminating the area. Hundreds of thousands of inhabitants of cities and villages studied in Osoaviakhim units and learned how to deal well and quickly with possible centers of destruction. During the course of continuous studies and training under conditions that approached combat situations, they built bomb shelters and first-aid stations.

Osoaviakhim and the MPVO have written many brilliant pages into the chronicle of the heroic struggle of the Soviet people against the German fascist invaders. Having truly become the irreplaceable producer of military specialists for the Red Army and its reliable helper, the defense society also successfully fulfilled the duty that it was given on the mandatory training in air defense of all citizens from 8 to 60 years of age.

The civilian population fought fires heroically. And out of every 100 fires, 99 were extinguished by self-defense groups, trained by Osoaviakhim. In Leningrad alone, over 36,000 activists were awarded orders and medals by the defense society. No less courageous during air raids were self-defense groups in Moscow, Tula, Stalingrad, Murmansk, Sevastopol, Voronezh, and other cities.

During the postwar period, a new life-giving impulse for developing and strengthening official ties and cooperation between the defense society and the USSR Civil Defense was given by the decree of the CPSU Central Committee and the USSR Council of Ministers of May 7, 1966, entitled "On the Status and

Measures for Improving the Work of the All-Union Volunteer Society for the Cooperation of the Army, Aviation, and Fleet (DOSAAF SSSR)." This decree became a program document for the defense society, which determined the direction and the contents of its activities for a prolonged period. Together with concrete tasks on further raising the level of mass defense work among the population and a broad enrollment of Soviet people in the cause of strengthening the defense capability of the country, the decree pointed to the necessity of activating the cooperation of DOSAAF organizations for the purpose of taking measures on the Civil Defense of the USSR.

The defense society accepted the given tasks on the further strengthening of official ties with organs of civil defense as an indivisible and important part of the mass defense work among the population. The USSR DOSAAF Central Committee, the DOSAAF Central Committees of Union Republics, regional, oblast, district and city committees and primary organizations of DOSAAF took effective measures facilitating more precise joint planning, training, and conducting mass defense measures, and measures for civil defense, and increased the quality of training activists in the practice of joint undertakings with CD and its propaganda among the population.

Since the time that the CPSU Central Committee and the USSR Council of Ministers decreed that the activities of the defense society be improved, the training organizations of DOSAAF have trained over 20 million qualified technical specialists for the national economy of our country, including drivers, tractor drivers, bulldozer operators, automatic crane operators, etc. It is clear that the training of such specialists has an important significance not only for the national economy, but also for defense, since it serves as an accumulated technical trained reserve for the needs of the armed forces and civil defense.

A great amount of help is given to organs of civil defense by committees, organizations and DOSAAF Houses in training workers, draftees and students in defense against weapons of mass destruction. The DOSAAF Publishing House regularly issues mass editions of books, brochures and poster sets on the subject of civil defense in response to requests by ministries and departments.

Questions of helping CD in its propaganda among the population as shown by appropriate tests are regularly discussed at meetings of presidiums of republic, regional and oblast committees of the society and at meetings and training-methodological sessions of civilian workers and activists of DOSAAF. The strengthening of official cooperation is also facilitated by the fact that the majority of chiefs of civil defense staffs are also members of DOSAAF committees, and many activists of the defense society, in turn, are commanders of non-military formations.

Let us take, for example, the Latvian SSR. Here, under the direction of DOSAAF Central Committee party organs and the civil defense staff of the republic, basic measures in mass defense work are being successfully implemented. In all this, it has been taken into consideration that military-patriotic education, training and defense-sport work, as well as

propaganda knowledge about civil defense, is a united process that demands agreement, close coordination and constant contacts between DOSAAF and CD workers of all elements with the goal of the best possible utilization of mutual capabilities in the interest of the common cause. Emanating from this are also friendly joint activities in training and conducting monthly mass defense work, holding civil defense months, weeks and days, organizing inspections-competitions for the best training place in basic military training, with special consideration for high quality work in programs on civil defense themes. In primary DOSAAF organizations of the republic, there are often meetings between young people and veterans of war and labor, MPVO and CD, and they fulfill norms for a general, mandatory minimum knowledge on protecting the population from weapons of mass destruction.

Instructive in this respect is also the activity of the Riga DOSAAF House, which devotes a great deal of attention to civil defense propaganda. Just in the current year, they have had seminar training sessions, with chairmen of district and city committees of the defense society on the theme of "The 26th CPSU Congress on the Necessity of Further Improving Civil Defense," a theme evening on "Civil Defense - Everybody's Concern," a seminar with CD chiefs of staff of installations of one of the districts on organization, training, and conducting comprehensive installation training. The DOSAAF House, together with the republic organization of the All-Union "Znaniye" Society, established a special group of reviewers on questions of civil defense; it conducts studies with lectures and propagandists, with the goal of increasing their special knowledge; and organizes many other interesting and useful activities.

Examples of active and friendly work in disseminating military knowledge and propaganda about civil defense among the population can be given by many DOSAAF Committees and CD staffs of the Ukraine, Belorussia, Uzbekistan, the Maritime Region and the Moscow Oblast. The bases of these fruitful joint activities have been laid in labor collectives and in installations of the national economy, such as, for example, the L'vov "Electron" Production Society, the Yaroslav "Lakokraska" Production Society, the Tashkent Aviation Production Society imeni V. P. Chkalov, and many others where DOSAAF committees and organizations of mass defense work consider joint work with CD staffs as their sacred duty.

A comprehensive party and philosophical approach toward accomplishing the given task distinguishes the work of the DOSAAF committee chairman and the CD chief of staff of the Vologodskiy Railroad Car Repair Plant imeni M.I. Kalinin, S.I. Pustovalov and V.T. Oborin. They do not wait for instructions from "above," but use their initiative and are persistent in completing the tasks that they have been given. In accordance with the joint plan that they have worked out, dedicated to the 50th anniversary of the USSR CD, there is a special series of lectures and reports held at the plant and discussions are being conducted on the role and meaning of civil defense. Methodological presentations have been prepared on the themes of "Civil Defense and Its Tasks" and "The Dependable Guard of Peaceful Labor," and seminar study sessions have been organized for propagandists. Broad-based oral propaganda is reinforced here with technical means that are available. The enterprise has weekly radio lectures on mass defense themes, and every month there are film lectures.

DOSAAF members of the plant provide efficient help in improving training material aids that are necessary for training and preparing pre-draft youth in CD. DOSAAF activists do a great deal in fulfilling CD norms among school children who belong to the plant pioneer camp, and in the course of the military-sport game of children, "Zarnitsa." The primary organization of the defense society assists the CD staff of the installation in equipping and training non-military formations, and in establishing colorful model CD training areas and CD corners in shops and sections of enterprises. DOSAAF members are indispensable participants of command staff and comprehensive training at installations. Examples such as this are abundant.

In recent years the defense society has done a great deal to improve propaganda among the population with regard to civil defense. Widely used are such forms of joint work as evening meetings with participants of the Great Fatherland War, veterans of the MPVO and CD, outstanding workers of civil defense; discussions, quizzes and recitations on various CD themes; lectures, discussions, film talks; conducting competition with elements of military-application units; fulfilling CD norms, etc.

All this undoubtedly facilitates the broad grasp of defense knowledge by broad categories of the population and a qualitative readiness of the workers to defend the Motherland. However, it would be incorrect to say that there are no shortcomings in the matter of propaganda on civil defense and cooperation on the part of committees and organizations of DOSAAF. In places one still meets examples of timid and sometimes also unwilling departure from narrow departmental parameters. Some DOSAAF committees still underrate the matter of cooperation with CD and consider it secondary, forgetting that this direction of mass defense work is clearly and concretely included in the charter of the defense society.

What such an underrating can lead to may be judged by the following fact: In 1981 the Ryazan Oblast Committee of DOSAAF developed a propaganda plan for civil defense, but "forgot" to coordinate it with the oblast CD staff. As a result, many military-patriotic measures stipulated here turned out to be barely effective and were not substantive in content. And if there is no agreement as to the activities of higher standing committees and staffs, then the district organizations will conduct mass defense work that is in conflict with CD staffs. This is what happened in the Oktyabr'skiy District of the city of Ryazan'. True, after a check that was conducted here by a joint commission of the USSR DOSAAF Central Committee and the national CD staff, the indicated shortcomings were eliminated.

The decree approved in May of this year by the Bureau of the Presidium of the USSR DOSAAF Central Committee "On the 50th Anniversary of Civil Defense of the USSR," required the DOSAAF Central Committees of Union Republics, regional, oblast, district and city committees, primary, educational and sports organizations of DOSAAF to participate actively in preparation for the important jubilee in the history of CD. In carrying out this decree, the committees of the defense society are scheduling their work in such a way that the preparation for the CD jubilee would be assisted by mobilizing all members of DOSAAF in the struggle for further strengthening the economic and

defensive might of the socialist Motherland, raising the quality and effectiveness of military-patriotic and mass defense measures, and guaranteeing the strengthening of official ties with organs of civil defense.

DOSAAF committees activate propaganda among members of the society on civil defense knowledge; they explain more comprehensively and purposefully to the workers, especially youth, the nature of modern war, the duties of the population in implementing measures approved by the Communist Party and the Soviet government with regard to the country's civil defense; they educate the Soviet people in having a high degree of vigilance, steadfastness, discipline and organization, and being able to function precisely and confidently in a complex situation which could arise in case of an invasion by an aggressor.

The 50th anniversary of the USSR CD coincides with an important stage in the life of the defense society, the preparation for the 9th All-Union DOSAAF Congress and a reporting and election campaign. Summing up the work that has been done in the past five years and making future plans for their activities, committees of the society are devoting an important place to problems of further strengthening official ties with organs of civil defense, improving the methodological direction of giving youth basic military training on the theme of "The Basic of Civil Defense," and increasing the activity of DOSAAF members in conducting CD measures.

The defense society, with more than 100 million members, twice decorated, is celebrating its regular All-Union Congress with new successes in military-patriotic, mass defense training and sports work. Members of the USSR DOSAAF, closely tied to the Communist Party of the Soviet Union and its Leninist Central Committee, are fully resolved to increase their efforts in strengthening the economic and defensive might of our dear Motherland in the future in friendly cooperation with trade unions, Komsomol, political organizations of the Armed Forces, military enlistment and registration offices, civil defense staffs, the "Znaniye" Society, and other social organizations.

We have a common task and a unity of thought!

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DOSAAF AND MILITARY COMMISSARIATS

BASIC TRAINING: LECTURE ON PT-76 AMPHIBIOUS TANK

Moscow VOYENNNYYE ZNANIYA in Russian No 10, Oct 82 (signed to press 13 Sep 82)
pp 28-29

[Article by Engineer-Colonel V. Knyaz'kov: "Amphibious Tank"]

[Text] Most readers have seen tanks, either in movies or in "life." They know that this is a very massive and very heavy combat vehicle. Is it possible that it can float? It turns out that there is such a thing: We are talking about an amphibious tank, the PT-76.

The basis of its armament is a 76.2 mm tank cannon. It is designed for combat against enemy tanks and self-propelled guns. Of course, it is also used to suppress and destroy artillery, other weapons and manpower.

The maximum sighting firing distance of the PT-76 is 4,000 m. But if the longitudinal level is used, then shells from the tank cannon can reach a distance of up to 12,000 m. In other words, in this case the tank becomes an ordinary artillery weapon, firing from a concealed position. The rate of aimed fire of the tank cannon reaches seven rounds per minute. This is a sufficiently high indicator. For all practical purposes, a shell pierces a target in intervals of less than nine seconds.

The basic parts of a cannon are: barrel, semi-automatic breech mechanism and a cradle with recoil mechanisms.

The barrel, as in any artillery weapon, is actually a long steel tube, along the rifled bore of which the shell moves under the pressure of powder gases. The shell acquires a rotating movement, which guarantees it a stable flight. The back end of the barrel bore is smooth-walled. This is the powder chamber. Here, before it is fired, is a fixed round, consisting of a shell, charge and shell case, all comprising a single unit. Picture an ordinary automatic or pistol round, enlarged in size dozens of times, and you will have, in principle, an artillery shot that is called a fixed round. This is why a cannon can be loaded in one step, conveniently and quickly.

A muzzle brake is fixed at the end of the cannon barrel. Its purpose is to diminish the magnitude of the recoil. This point is very important for designers because the dimensions of the crew compartment are strictly

limited. The cannon of the amphibious tank has a so-called active type muzzle brake. What does this mean? Let us assume that a shot was fired, the shell cleared the muzzle brake, and the powder gases, flying out of the barrel right after the shell (of course, not all of them, only some), hit the front wall of the muzzle brake. A force is created, which is what pushes the cannon's barrel forward and which, in short, lessens the kick and, consequently, the size of the recoil.

A cylindrical thickening can be noted on the cannon barrel. The ejection mechanism is located at this point, which serves to dispel the powder gases. And another question arises: Why should they be ejected from the barrel if immediately after the shot, literally within a few seconds, the loader will force the next round into the powder chamber and the breech end of the barrel will be "hermetically" closed by the breechblock? It turns out that this has to be done. What happens is that some of the powder gases are able to "break into" the crew compartment and then the crew would have to work in a gas-polluted environment. The ejector comes to the rescue and prevents this from happening. Its operating principle consists of the following: After a shot has been fired, a vacuum is formed in the bore which "carries away" and "sucks out" the powder gases from the bore, but only toward the front, not the back. Thanks to this, crew members are assured normal environmental conditions.

Inside the turret and parallel to the cannon and welded onto it is a SCMT heavy machine gun, designed by Goryunov, modern, and specially made for tanks. It is designed to fire on ground targets, primarily against manpower and open firing points of the enemy. The maximum sighting firing distance, with the aid of a sight, is up to 2,000 m. Effective rate of fire is from 200- 250 rounds per minute. It is a ribbon-feed, and the number of cartridges in the ribbon is 250.

The weight of the amphibious tank is 14 tons and the overall dimensions are 6910 x 3140 x 2255 mm. Within such a limited space Soviet designers were able to place dozens of various nodes and systems, and three crew members, the commander, driver-mechanic and weapon loader; they were able to cover everything with armored protection and, in addition to everything else, provide the capability of loading the vehicle with ammunition. And, in fact, there is not that little ammunition: 40 cannon rounds, 1,000 machine gun cartridges, 300 rounds for the Kalashnikov submachine gun, 15 F-1 hand-grenades and 20 cartridges for a signal pistol.

Bear in mind that there is no gunner among the crew members. The tank commander here wears two hats, both as a commander and as a gunner. If he spots a target, he makes a decision himself and fires on the target himself. He can fire a cannon and can also fire the machine gun. Electronic triggers are right where he can reach them.

The PT-76 is equipped with various optical devices which crew members know how to use expertly, and through which they can see everything that occurs on the battlefield and within visual range. We are talking about tank observation and sighting devices which allow the tankers, both day and night, to conduct reconnaissance of the terrain, to locate targets and destroy them with artillery and machine gun fire.

Let us remember what characteristics Vasiliy Terkin, the hero of the well-known poem by A. Tvardovskiy, gave the tank. "The tank is very frightful in appearance, but in reality is deaf and blind" This evaluation, of course, was given in a jocular tone. However, let us say plainly that the modern tank is neither blind nor deaf. The PT-76 has nine observation devices. The tank commander has three, the weapon loader one, and the driver-mechanic five, including one device for night viewing.

In addition, the tank commander also has a telescopic hinged sight for the cannon and machine gun. And the PT-76's "hearing" is not bad either. We have in mind its means of communication, particularly the R-113 receiving-transmitting telephone radio station, with an operational radius of no less than 20 kms on a 4-meter antenna. Crew members communicate among themselves through a tank intercom system.

Our readers have undoubtedly seen on television how amphibious tanks work, for example when marines land on a beach. Landing ships approach the designated place, lower their ramps right into the water, and the amphibious tanks, notwithstanding waves, head for the beach. A boom suddenly rolls out over the water: it is a cannon shot; it is followed by a second and a third one. The tanks are firing on shore artillery points while floating in the water. Their speed in the water can reach 10.2 km/hr. Their range, in the water, is 60-70 kms.

Exactly how does the tank float? For this purpose, two water jet propellers are installed. They are located in the engine compartment along the sides of the tank body.

If we say that the water jet propellers throw the water, then it stands to reason that this is not an original idea. The readers of this journal are already familiar with devices which throw not water, but bullets, grenades and mines. But a water-throwing propeller is not a weapon, it is an engine. Experts place it in the category of hydraulic jet propellers. Their mode of operation is extremely simple: They take water from a reservoir with the aid of a pump, push it through water pipes and eject it to the rear through small pipes located in the stern. The result is a jet force which pushes the tank in the direction opposite to the direction of the water that is being ejected.

To turn a tank while it is floating is also not a difficult matter. For this, shutters are used that can cover the stern pipes. If the driver-mechanic turns the right lever to the rearmost position, the shutter completely blocks the sternpipe of the right side propeller. The tank turns to the right. In so doing, if the tank is not moving, its turn radius is minimal, only 3-5 meters. A left turn is made in a similar manner. Only in this case the driver-mechanic moves the left lever to the rearmost position.

And what will happen if you move both levers to the rear at the same time? Let us go through this experiment mentally. Let us move the levers "toward ourselves" as far as they will go. The shutters completely cover the stern outlet pipes. In this case, the water goes through the reverse movement pipes and is ejected in the direction of the nose part of the tank. The combat vehicle begins to move backwards at a rate of up to 3-5 km/hr.

Let us note one important characteristic: The amphibious tank is capable of crossing water barriers when a landing takes place in back of the turret. In doing this, the landing commander can maintain constant communication with the tank commander through the tank intercom system. For this purpose, a metal box is attached to the outside of the turret which contains a portable vest switch equipped with a cord.

What should a tank commander and driver-mechanic take into consideration when crossing a water barrier? They should know their route, that is, they should reconnoiter it. The steepness of a downward slope should not exceed 30 degrees, and the upward incline, upon leaving the water, should not exceed 25 degrees.

If the water area is covered with ice fragments or water vegetation, then in order to turn the tank, one needs to use steering clutches. Why? It is better, because it provides a full guarantee of avoiding the shutters being jammed. The driver-mechanic, for example, depresses the right lever of the steering clutch, the right caterpillar track is braked, while the left track continues rotating, and the tank turns to the right. The turn radius, in this maneuver, is about 11-13 m.

And how does the amphibious tank "feel" when it is on dry land? Now it climbs out on shore and solidly stands on its caterpillar tracks. The load-bearing surface for a combat vehicle of this type is completely normal, 4080 mm. And the mean specific pressure on the ground is also not very great, only 0.5 kg per square centimeter.

There are the same kind of criteria for assessing the maneuverability of the PT-76 on land as for other tanks. There are only three: Mobility, turning ability and cross-country capability. The basic indicators of mobility are mean speed and operating range. On a highway its mean speed is 20-35 km/hr., and maximum speed is 44 km/hr.

Its operating range, moving on a highway, is up to 240-260 kms. Turning ability gives the tank maneuver capability on a combat field, as well as in actions in mountains and populated areas. A tracked vehicle, in contrast to a wheeled one, can practically turn in place. If one track is fully braked, the turn radius will be minimal. It is equal to the width of the track ruts, which is not large in the PT-76, being only 2740 mm.

Cross-country capability of a tank is its ability to move where there are no roads, as well as to cross natural and artificial barriers. The official name, "PT-76 amphibious tank," speaks for itself. We have already been convinced of the tank's excellent capabilities in crossing water barriers. But even on dry land this "swimmer" holds up well. It can move up the incline of a hill or mountain with confidence if the maximum angle of climb is not over 38 degrees. It is capable of withstanding a lateral slope of 18 degrees, cross a ravine of up to 2.8 meters wide and cross over a vertical wall of up to 1.1 m high.

In combat, of course, there are no ideal conditions for aiming, orientating, or performing a maneuver. And if, for example, it is difficult to get orientated under combat conditions, tankers can be saved by a course indicator, a gyroscopic semicompass, attached to the upper front oblique armor plate located in the crew compartment to the left of the central instrument panel of the driver-mechanic.

It is not difficult to drive a tank with a gyroscopic semicompass. Before beginning to move, the tank is orientated on some local object which is selected according to a given direction. How? The tank turret is turned so that the barrel of the cannon faces precisely to the front, and the central point of the gunsight, the gyro-semicompass and the zero marker on its indicator is fixed on the object. At the command, "Forward!," the driver-mechanic frees the apparatus from its fixed position and begins driving the tank. The job of the driver-mechanic is to maintain the zero on the scale according to the indicator. One can move this way for a period of 15-20 minutes, after which it is necessary to reorientate the tank once again.

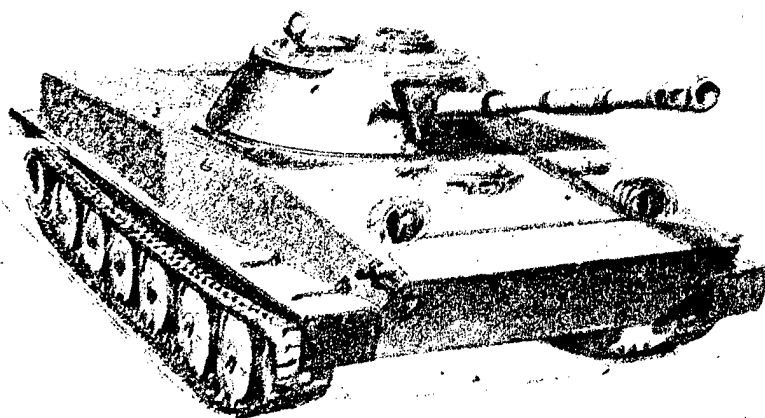
The PT-76 tank has also been provided with means of camouflage organic to the tank, which give it the capability to throw up a smoke screen. What we are talking about is a smoke release system which can switch on a thermo-condensing smoke apparatus that can be used repeatedly. Diesel fuel from the tank's engine fuel system is used as the smoke-creating substance.

What then are the tactical-technical characteristics of the smoke-release system? The operational capability of the thermo-smoke apparatus is very great. It can practically be switched on in a second. All that is required is to have the tank engine working. The length of the smoke screen that cannot be seen through is 300-400 m, and its duration is rated at two minutes. The duration of a single smoke release should not exceed ten minutes.

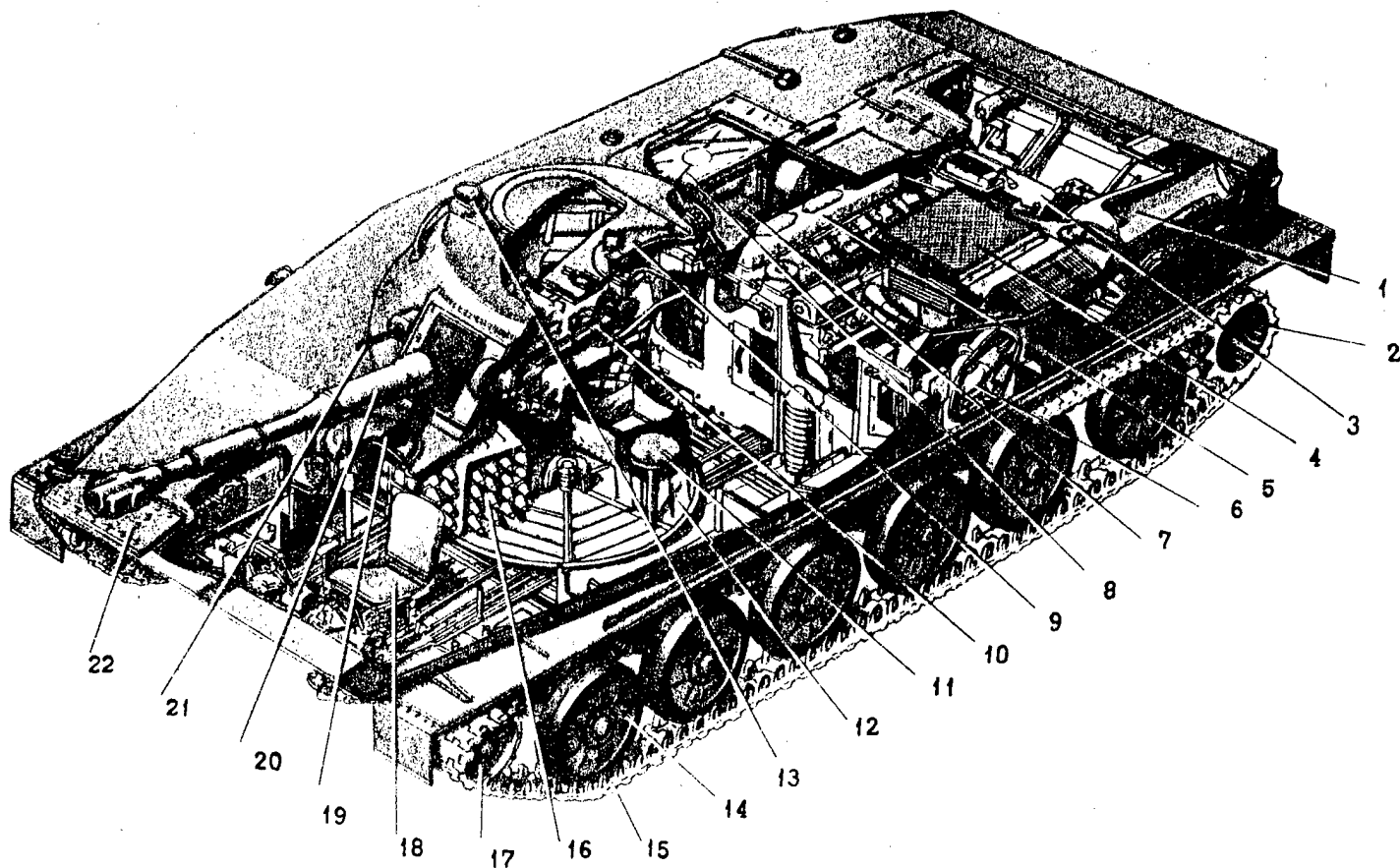
In designing the amphibious tank, other apparatuses and units were provided, fulfilling strictly determined functions. These include equipment for ensuring the flotation and stability of the tank, water pumping apparatus, fire fighting equipment, control and measuring apparatus, etc.

In concluding this discussion devoted to the Soviet made amphibious PT-76 tank, it is necessary to emphasize its main quality: High reliability. Soviet tank designers have created the kind of a combat vehicle that unflinching works under any climatic condition. It is necessary only to adhere to the operating rules for all the assemblies and then this unique armored fortress will function excellently under any combat situation.

ПЛАВАЮЩИЙ ТАНК ПТ-76



1. Водопроводная труба.
2. Ведущее колесо гусеничного движителя.
3. Коробка передач.
4. Масляный радиатор.
5. Двигатель танка.
6. Рабочее колесо водяного насоса [двигатель водомета]
7. Масляный бак.
8. Топливный бак.
9. Командирская башенка.
10. Телескопический прицел.
11. Сиденье командира танка.
12. Вращающийся пол боевого отделения танка.
13. Перископический прибор наблюдения заряжающего.
14. Опорный каток танка.
15. Гусеница (траки).
16. Боеукладка (снаряды к пушке).
17. Направляющее колесо гусеничного движителя.
18. Сиденье механика-водителя.
19. Люк механика-водителя.
20. Ствол пушки.
21. Пулемет.
22. Подъемный волноотражательный щит.



(Rear Cover)

PT-76 AMPHIBIOUS TANK

Key:

1. Water pipe.
2. Driving wheel of the caterpillar track running gear.
3. Transmission (Gear Box).
4. Oil Radiator.
5. Tank engine.
6. Working wheel of water pump (Running gear of water jet).
7. Oil tank.
8. Fuel tank.
9. Commander's turret.
10. Telescopic sight.
11. Tank commander's seat.
12. Rotating floor of the tank's crew compartment.
13. Periscope apparatus for gunner's observation.
14. Tank suspension wheel.
15. Caterpillar tracks.
16. Ammunition storage (shells for cannon).
17. Idler wheel for track running gear.
18. Driver-mechanic's seat.
19. Observation port for driver-mechanic.
20. Cannon barrel.
21. Machine gun.
22. Movable wave-repelling shield.

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DOSAAB AND MILITARY COMMISSARIATS

BASIC TRAINING: LECTURE ON ASW SHIPS

Moscow VOYENNIYYE ZNANIYA in Russian No 10, Oct 82 (signed to press 13 Sep 82)
pp 29-30

[Article by Captain 1st Rank S. Rodinov: "Antisubmarine Ships"]

[Text] At the beginning of our century, submarines, "hidden" ships, appeared in the fleet inventories of the leading naval powers. The appearance of this new type of power for the fleet was met with skepticism by most of the naval experts of the time. The commanders of powerful battleships glanced with disdain from the height of their bridges at the small, insignificant-looking "tin tadpoles." And at first, few persons seriously thought what danger for the powerful battleships and cruisers lay in submarines. At the time no one gave any thought to creating some sort of means to combat them.

The thunder struck at the very beginning of World War I. On September 22, 1914, London received news that shook up the "fathers" of the naval admiralty: In the North Sea, within the course of one hour, the German submarine "U-9" had torpedoed and sunk three English cruisers, the "Aboukir," "Cressy" and "Hogue."

The triumph of the "U-9" and the loss of 1135 human lives shocked the fleet staffs. The warring countries, in short order, began to develop equipment, weapons and techniques to combat the submarines. Thus began the many-year-long competition between the submarine and surface ships which is continuing even today.

Over the years of World War I, 300 active submarines of all the warring countries sank 237 combat ships and nearly 6,000 merchant ships. In order to protect shipping and protect ships against submarines during combat operations, up to 5,000 ships, 2,000 aircraft and many different types of weapons and equipment were needed. Special trap ships were designed (there were 78 of them in England), which lured the undersea corsairs to the surface with their innocent look and then shot them to bits at point blank range with their artillery. Hydroacoustic apparatus was designed to locate submarines and to destroy them with depth bombs. Special antisubmarine ship hunters were hurriedly built at the yards to go after the submarines. They protected surface ships at sea, escorted ships and carried out submarine hunts. These actions immediately brought success to this new class of ship forces. During

World War I, these ship hunters destroyed 86 submarines (28 by ramming, 27 by artillery and 31 with depth bombs). Aviation's share was at first only 10 submarines.

During World War II, the duel between submarines and antisubmarine ships grew more fierce: 1145 submarines were destroyed by all the warring countries. Of these, 406 submarines (35.4 percent) were destroyed by surface ships.

At the beginning of the war our navy had 176 ships equipped with anti-submarine weapons (59 small and regular destroyers; 40 patrol vessels and cutters; and 77 submarine hunters). However, there were not enough anti-submarine forces for reliable defense against enemy submarines. For this reason, the fleet commands were forced to deploy for antisubmarine defense antimine ships, minesweepers and even torpedo boats. Soviet seamen did not give the fascist submarines the opportunity to sink our warships and merchant ships with impunity. Thus, the North Sea sailors efficiently masked all the communications of our northern ports. Of 778 transport ships, sailing in 41 different convoys, 60 did not reach Soviet ports, and from our ports 707 transport ships left for the west, of which only 22 were lost. This is what a reliable antisubmarine defense is all about.

Different forces of the fleet are used for combatting submarines: surface ships, submarines and aviation. Surface ships, whose primary mission is to search for and destroy atomic and diesel submarines, constitute a separate class of antisubmarine ships. In our fleet, the ships that belong to this class include the antisubmarine cruisers (PKR) of the "Kiev" and "Moskva" type, large antisubmarine ships (BPK) of various types, patrol vessels (SKR), small antisubmarine ships (MPK) and antisubmarine cutters. Antisubmarine cruisers and BPK are capable of operating in oceans and seas over long periods of time, SKR, MPK and antisubmarine cutters comprise the basic antisubmarine forces for offshore operations. Most antisubmarine ships have as part of their equipment excellent hydroacoustic devices, a varied selection of antisubmarine weapons; and some of them carry antisubmarine helicopters aboard ship.

In the postwar years, thanks to the tireless effort of the party and government, the golden hands of Soviet designers, engineers and workers built marvelous, modern antisubmarine ships capable of completing any mission, no matter how complex, for the reliable protection of the Motherland in the World Ocean.

Extraordinarily beautiful and unusual in its ship architecture is the anti-submarine cruiser "Kiev." Its dimensions are reminiscent of a high building. Instead of a roof, there is an airdrome the size of a football field. This is the flight deck, and white circles clearly stand out: These are landing areas from which VTOL jet aircraft roar upwards. A multistory superstructure located to the right is covered with radar antennas. The cruiser is well armed and is capable of accomplishing various combat missions under the most complex weather conditions, in any part of the World Ocean, both independently and in conjunction with other fleet forces. Missiles of various designations and a powerful antisubmarine weapon and artillery provide the

ship with the capability of conducting strikes against targets which are located at a distance of many kilometers. Electronic and radio-technical means allow a more precise and quick assessment of the sea, underwater and air situation, and an effective use of the ships weapon systems.

The hull of the cruiser is huge. It is difficult even for the ocean to make this monster rock back and forth. Experts who built it say that on its hull just one letter from the name "Kiev" weighs 750 kilograms.

The ship's crew is housed in spacious and comfortable living quarters.

Somewhat different in their exterior appearance and architecture are the "Moskva" type antisubmarine cruisers. The main weapon of these ships, in addition to powerful antisubmarine armament, are helicopters which fly right from the deck. The rotor-driven machines significantly increase both the speed with which the ocean depths can be observed and the reliability of locating submarines.

The large antisubmarine ships (BPK) of our fleet noticeably differ from similar ships of western countries. The smooth lines of the hull and the original architectonics, designed in accordance with the best standards of ship mechanics and world shipbuilding requirements, allow the BPK to be stable and to easily increase its speed and maneuver freely in any wave and under the most cramped conditions of any water area. The BPK is equipped with the latest highly sensitive hydroacoustic systems, capable of locating atomic submarines at great depths and distances. In order to destroy them, many BPK's are equipped with antisubmarine missiles, torpedo missiles, multiple rocket bomb mountings and powerful self-guiding torpedoes. Their great sailing distance and self-sufficiency at sea allow BPK's to function at great distances from their bases.

For repelling enemy air attacks, the BPK is armed with antiaircraft missiles and multiple rapid-fire artillery. Nearly all BPK's have the capability of carrying an antisubmarine helicopter on its upper deck.

Small antisubmarine ships and cutters are designated for searching out and destroying submarines in coastal areas and closed seas in close proximity to their bases. While smaller than BPK's in size and having fewer combat capabilities, they nonetheless also have complete hydroacoustic apparatus and combat weapons that are powerful for the ship's displacement: torpedoes, depth bombs, and rapid-fire artillery.

Our antisubmarine ships accomplish complex combat training missions. The submarine and the antisubmarine ship always operate under unique conditions. In battle, they do not visually see one another, only hear one another. The entire complexity of such a duel consists of the fact that a submarine, while it is being looked for, is not passive; it does not wait to be discovered and attacked. It uses every possible maneuver, changes depth, employs different types of interference and, if necessary, itself fires a torpedo at the antisubmarine ship.

The duties of a seaman aboard an antisubmarine ship are not easy. Not easy, but honorable. Servicemen of the most varied specialties comprise its cohesive crew, which is fully capable of resolving any problem having to do with the protection of the Soviet Motherland.

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